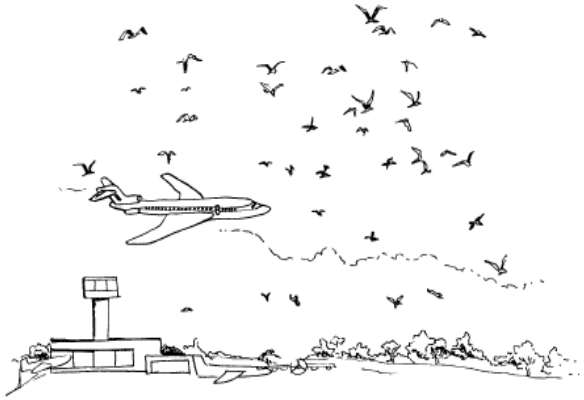
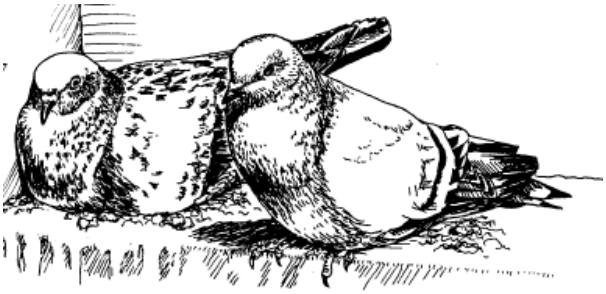
UNITED STATE DEPARTMENT OF AGRICULTURE
Animal and Plant Health Inspection Service
Wildlife Services

ENVIRONMENTAL ASSESSMENT

BIRD DAMAGE MANAGEMENT IN NEBRASKA:

Reducing Human/Bird Conflicts





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Reducing Human/Bird Conflicts

Prepared by:

UNITED STATES DEPARTMENT OF AGRICULTURE (USDA)
ANIMAL AND PLANT HEALTH INSPECTION SERVICE (APHIS)
WILDLIFE SERVICES (WS)

In Cooperation With:

UNITED STATES DEPARTMENT OF THE INTERIOR
UNITED STATES FISH AND WILDLIFE SERVICE (USFWS)

FEDERAL AVIATION ADMINISTRATION (FAA)

UNITED STATES AIR FORCE (USAF)
OFFUTT AIR FORCE BASE

NEBRASKA GAME AND PARKS COMMISSION (NGPC)

NEBRASKA DEPARTMENT OF AGRICULTURE (NDA)

UNIVERSITY OF NEBRASKA-LINCOLN EXTENSION (UNLE)

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Acronyms Used in the EA

AC	Alpha Chloralose
AGL	Above Ground Level
APHIS	Animal and Plant Health Inspection Service
AVMA	American Veterinary Medical Association
BASH	Bird Aircraft Strike Hazard
BBS	Breeding Bird Surveys
BGEPA	Bald and Golden Eagle Protection Act
CDC	Centers for Disease Control and Prevention
CDFG	California Department of Fish and Game
CE	Categorical Exclusion
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
DP	Depredation Permit
EA	Environmental Assessment
EIS	Environmental Impact Statement
EJ	Environmental Justice
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulations
FDA	Food and Drug Administration
FIFRA	Federal Insecticide, Fungicide and Rodenticide Act
FONSI	Finding of No Significant Impact
FY	Fiscal Year
HPAI	High Pathological Avian Influenza
IWDM	Integrated Wildlife Damage Management
INAD	Investigative New Animal Drug
LD	Lethal Dose
MA	Methyl Anthranilate
MBTA	Migratory Bird Treaty Act
MIS	Management Information System
MMWR	Morbidity and Mortality Weekly Report
MOU	Memoranda or Memorandum of Understanding
NDA	Nebraska Department of Agriculture
NDOR	Nebraska Department of Roads
NEDS	National Early Detection System
NEPA	National Environmental Policy Act
NGPC	Nebraska Game and Parks Commission
NHPA	National Historical Preservation Act
NWRC	National Wildlife Research Center
SHPO	State Historic Preservation Office
SOP	Standard Operating Procedure
T/E	Threatened and Endangered Species
UNLE	University of Nebraska - Lincoln Extension
USAF	United States Air Force
USC	United States Code
USDA	U.S. Department of Agriculture
USDI	U.S. Department of the Interior
USFWS	U.S. Fish and Wildlife Service
USGS	U. S. Geological Survey
WS	Wildlife Services
WNV	West Nile Virus

SUMMARY OF PROPOSED ACTION

The United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Wildlife Services (WS), U.S. Fish and Wildlife Service (USFWS), Federal Aviation Administration (FAA), U.S. Air Force (USAF), Nebraska Game and Parks Commission (NGPC), Nebraska Department of Agriculture (NDA), and University of Nebraska-Lincoln Extension (UNLE) propose to continue the current bird damage management program in the State of Nebraska. WS, USFWS, FAA, USAF, NGPC, NDA and UNLE use an Integrated Wildlife Damage Management (IWDM) approach to reduce human/bird conflicts and damage to property, agricultural resources, natural resources, and human/public health and safety, as appropriate. In addition under the current program, the USFWS would continue to issue depredation permits based on need and recommendations from WS.

It is anticipated, based on historical information, that the majority of Nebraska WS' human/bird conflict reduction activities will be at Nebraska airports, livestock facilities, ethanol plants and at various municipalities to protect health and human safety by reducing aircraft/bird strikes, or reduce European starling (*Sturnus vulgaris*) feed consumption and fecal contamination, and reduce potential risk of disease transmission to livestock. Another important function of the Nebraska WS program is the protection of property and aquaculture resources.

WS bird damage management would be conducted on public and private property in Nebraska only when the resource owner (property owner) or manager requests assistance. An IWDM strategy would be recommended and used, encompassing the use of practical and effective methods for preventing or reducing damage while minimizing harmful effects of damage management measures on humans, target and non-target species, and the environment. Under the current program, WS would provide technical assistance and operational damage management, including non-lethal and lethal management after applying the WS Decision Model (Slate et al. 1992). When appropriate, physical exclusion, localized habitat modification, relocation, or harassment would be recommended and utilized to reduce damage. In other situations, birds would be removed as humanely as possible using: shooting, trapping, registered avicides and other products. In determining the damage management strategy, preference would be given to practical and effective non-lethal methods. However, non-lethal methods may not always be applied as a first response to each damage problem. The most appropriate response could be a combination of non-lethal and lethal methods, or could include instances where application of lethal methods alone would be the most appropriate strategy, particularly if human health and safety are compromised (*e.g.*, aircraft/bird strike threats).

CHAPTER 1: PURPOSE OF AND NEED FOR ACTION

1.1 INTRODUCTION

Across the United States, wildlife habitat has been altered as human populations expand and land is used for human needs. These human uses and needs often compete with wildlife which increases the potential for conflicting human-wildlife interactions. In addition, certain segments of the public strive for protection of all wildlife. Such protection can create localized conflicts between humans and wildlife. The Final Environmental Impact Statement (EIS) (USDA 1997) for the United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Wildlife Services (WS) program summarizes the relationship in North American culture of wildlife values and wildlife damage in this way:

> *"Wildlife has either positive or negative values, depending on varying human perspectives and circumstances . . . Wildlife generally is regarded as providing economic, recreational and aesthetic benefits . . . , and the mere knowledge that wildlife exists is a positive benefit to many people. However . . . the activities of some wildlife may result in economic losses to agriculture and damage to property . . . Sensitivity to varying perspectives and values is required to manage the balance between human and wildlife needs. In addressing conflicts, wildlife managers must consider not only the needs of those directly affected by wildlife damage but a range of environmental, sociocultural, and economic considerations as well."*

With this said, the wildlife acceptance capacity and biological carrying capacity must be applied to resolving human/wildlife conflicts. The wildlife acceptance capacity, or cultural carrying capacity, is the limit of human tolerance for wildlife or the maximum number of a given species that can coexist compatibly with local human populations. Biological carrying capacity is the land or habitat's ability for supporting healthy populations of wildlife without degradation to the species' health or their environment over an extended period of time (Decker and Purdy 1988). These phenomena are especially important because they define the sensitivity of a community to a wildlife species. For any given damage situation, there will be varying thresholds by those directly and indirectly affected by the species and any associated damage or their perspective. This damage threshold is a factor in determining the wildlife acceptance capacity. While Nebraska may have a biological carrying capacity to support more birds of some species that are analyzed in this document (See Section 1.2), in many cases the wildlife acceptance capacity is lower or has been met. Once the wildlife acceptance capacity is met or exceeded, people begin to implement population or damage reduction methods, including lethal methods, to alleviate damage and public health or safety threats.

The alleviation of damage or other problems caused by or related to the behavior of wildlife is termed wildlife damage management and recognized as an integral component of wildlife management (The Wildlife Society 1992). WS uses an Integrated Wildlife Damage Management (IWDM) approach (WS Directive 2.105[1]), commonly known as Integrated Pest Management where a combination of methods may be used or recommended to reduce wildlife damage. IWDM is the application of safe and practical methods for the prevention and reduction of damage caused by wildlife based on local problem analyses and the informed judgment of trained personnel. Therefore, wildlife damage management is not based on punishing offending animals but is a means to reduce future damage and is implemented by considering the WS Decision Model (Slate et al. 1992). The imminent threat of damage or loss of resources is often

[1] The WS Policy Manual provides WS personnel guidance in the form of program directives. Information contained in the WS Policy Manual and its associated directives has been used throughout this EA, but has not been cited in the Literature Cited appendix.

sufficient for individual actions to be initiated and the need for bird damage management is derived from the specific threats to resources. WS recognizes that birds have no *intent* to do harm. They inhabit (*i.e.*, reproduce, walk, forage, deposit waste, etc.) habitats where they can find a *niche*. If they do *"wrongs,"* people characterize this as damage. *Wrongs*, unfortunately, are determined not merely in spatial terms but also with respect to time and other circumstances that define the *wrongness* (*i.e.*, birds or flocks of birds living in the wilds of Nebraska may not be a problem while birds inhabiting an airport facility or urban area could cause human safety concerns, potential human injuries, and destruction of property.)

IWDM, described in USDA (1997, 1-7), includes methods such as habitat and behavioral modification to prevent or reduce damage or may require that the offending animal(s) be removed[2] or that local populations or groups be reduced through lethal methods. Potential environmental affects resulting from the WS' application of various bird damage management techniques are evaluated in this EA.

Normally, individual wildlife damage management actions could be categorically excluded (CE) from further National Environmental Policy Act (NEPA) analysis[3], in accordance with APHIS (7 CFR 372.5(c), 60 Fed. Reg. 6,000, 6,003, (1995)) implementing regulations for NEPA. WS and the cooperating agencies (*i.e.*, U.S. Fish and Wildlife Service (USFWS), Federal Aviation Administration (FAA), U. S. Air Force (USAF), Nebraska Game and Parks Commission (NGPC), Nebraska Department of Agriculture (NDA) and University of Nebraska-Lincoln Extension (UNLE)) prepared this Environmental Assessment (EA) to: 1) facilitate planning, interagency coordination, and the streamlining of program management; 2) clearly communicate to the public the analysis of individual and cumulative impacts of program activities; and 3) evaluate and determine if there are any potentially significant or cumulative adverse affects from the proposed program. All wildlife damage management conducted in Nebraska would be undertaken in compliance with relevant laws, regulations, policies, orders and procedures, including the Endangered Species Act (ESA) of 1973, as amended (16 USC 1531-1543). This analysis relies on existing data contained in published documents (Appendix A and Section 1.6) and USDA (1997) whereby pertinent information has been incorporated by reference.

1.2 WS PROGRAM AND USFWS MIGRATORY BIRD PERMITTING PROGRAM

1.2.1 WS Program

WS is the agency directed by Congress to protect American resources, property, and human health and safety from damage associated with wildlife (Act of March 2, 1931, 7 U.S.C. 426-426b; c. 370, § 1, 46 Stat. 1468-69; Dec 13, 1991, Pub. L. 102-237, Title X, § 1013(d), 105 Stat. 1901, as amended Oct. 28, 2000, Pub. L. 106-387, § 1(a) [Title VII], § 767], 114 Stat. 1549). In 1988, Congress passed the "Rural Development, Agriculture, and Related Agencies Appropriations Act of 1988" (7 U.S.C. 426c; Pub. L. 100-202, § 101(k) [Title 1], Dec. 22, 1987, 101 Stat. 1329-331) which strengthened the Act of March 2, 1931 (Public Law 100-202).

In summary, Section 426 (the first section of the Act of March 2, 1931), as amended on

[2] All Migratory Bird Treaty Act (MBTA) protected birds may be removed under permits or Depredation Orders (DO) issued by the U.S. Fish and Wildlife Service (USFWS), as appropriate.

[3] To assist in ensuring compliance with the National Environmental Policy Act of 1969 (42 U.S.C. 4321–4370d) (NEPA), and in making a determination as to whether any "significant" impacts could result from the analyzed actions, "significance" under NEPA is defined by regulation at 40 CFR 1508.27, and requires short-term and long-term consideration of both the context of a proposal and its intensity, whether the impacts are beneficial or adverse. An EA provides evidence for determining whether to prepare an Environmental Impact Statement (EIS) or a statement of "Finding of No Significant Impact" (FONSI). If the decision maker determines that this project has "significant" impacts following the analysis in the EA, then an EIS would be prepared for the project. If not, a FONSI would be signed for the EA approving the alternative selected. As with any NEPA process, if all components have undergone equal analysis, the final proposal may include all or some components of a single alternative. Or, it may include a combination of components from more than a single alternative.

October 28, 2000, authorizes the Secretary of Agriculture to *"... conduct a program of wildlife services with respect to injurious animal species and take any action the Secretary considers necessary in conducting the program. The Secretary shall administer the program in a manner consistent with all of the wildlife services authorities in effect on the day before October 28, 2000."*

(Section 426 formerly provided the Secretary of Agriculture with the authority to *"... conduct such investigations, experiments, and tests as he may deem necessary in order to determine, demonstrate, and promulgate the best methods of eradication, suppression, or bringing under control on national forests and other areas of the public domain as well as on State, Territory, or privately owned lands of mountain lions, wolves, coyotes, bobcats, prairie dogs, gophers, ground squirrels, jack rabbits, brown tree snakes, and other animals injurious to agriculture, horticulture, forestry, animal husbandry, wild game animals, fur-bearing animals, and birds, and for the protection of stock and other domestic animals through the suppression of rabies and tularemia in predatory or other wild [sic] animals; and to conduct campaigns for the destruction or control of such animals: Provided, That in carrying out the provisions of this section the Secretary of Agriculture may cooperate with States, individuals, and public and private agencies, organizations, and institutions."*

Under 7 U.S.C. §426c, the Secretary of Agriculture is also *authorized "... except for urban rodent control, to conduct activities and to enter into agreements with States, local jurisdictions, individuals, and public and private agencies, organizations, and institutions in the control of nuisance mammals and birds and those mammal and bird species that are reservoirs for zoonotic diseases, and to deposit any money collected under such agreements into the appropriation accounts that incur the costs to be available immediately and to remain available until expended for Animal Damage Control activities."*

Under the Act of March 2, 1931, and 7 U.S.C. §426c, APHIS may carry out these wildlife damage management programs itself, or it may enter into cooperative agreements with States, local jurisdictions, individuals and public and private agencies whereby they may fund and assist in carrying out such programs. Id. These laws do not grant any regulatory authority. Therefore, there are no regulations promulgated under these statutes for wildlife services or animal damage control activities.

WS' mission (www.aphis.usda.gov/ws/mission.html), developed through its strategic planning process, is: 1) "*to provide leadership in wildlife damage management in the protection of America's agricultural, industrial and natural resources, and 2) to safeguard public health and safety."* This is accomplished through:

- Training of wildlife damage management professionals;
- Development and improvement of strategies to reduce losses and threats to humans from wildlife;
- Collection, evaluation, and dissemination of management information;
- Cooperative wildlife damage management programs;
- Informing and educating the public on how to reduce wildlife damage;
- Providing data and a source for limited-use management materials and equipment, including pesticides (USDA 1999).

WS is a cooperatively funded, service-oriented program. Before any wildlife damage management is conducted, a request must be received and an *Agreement for Control* must be

signed by the landowner/administrator or other comparable documents are in place. As requested, WS cooperates with land and wildlife management agencies to effectively and efficiently reduce wildlife damage according to applicable Federal, State and local laws (WS Directive 2.210). WS has the responsibility for responding to and attempting to reduce damage caused by migratory birds as specified in a Memorandum of Understanding (MOU) with the USFWS and in a MOU with the NGPC, and when funding allows.

1.2.2 USFWS Migratory Bird Permitting Program

The USFWS is the primary Federal agency responsible for conserving, protecting, and enhancing the Nation's fish and wildlife resources and their habitats. The USFWS mission is to conserve, protect, and enhance fish and wildlife and their habitats for the continuing benefit of the American people. Responsibilities are shared with other Federal, State, tribal, and local entities; however, the USFWS has specific responsibilities for endangered species, migratory birds, inter-jurisdictional fish, and certain marine mammals, as well as for lands and waters they administer for the management and protection of these resources.

The USFWS regulates the taking of migratory birds under the four bilateral migratory bird treaties the United States entered into with Great Britain (for Canada), Mexico, Japan, and Russia. Regulations allowing the take of migratory birds are authorized by the MBTA (16 U.S.C. Sec's. 703 - 711), and the Fish and Wildlife Improvement Act of 1978 (16 U.S.C. Sec. 712). The Acts authorize and direct the Secretary of the Interior to allow hunting, taking, and killing of migratory birds subject to the provisions of, and in order to carry out the purposes of, the four migratory bird treaties.

The USFWS has authority for issuance of Depredation Permits (DPs) (50 CFR 21.41) to persons who clearly show evidence of migratory birds causing or about to cause damage[4] WS assists permit applicants by providing management recommendations to the USFWS through the WS Permit Review Form 37 (WS Directive 2.301). Form 37 is used by WS to provide the USFWS the basic information (as identified in regulatory language 50 CFR §21.41) required as part of the migratory bird depredation permitting process. Form 37 provides a clear statement of the problem, how it is adversely affecting the applicant, and the action WS recommends to resolve the damage problem. In Nebraska, DPs issued by the USFWS are sent to the applicant.

The applicant then has to acquire a scientific collecting permit from NGPC for protected species. In cases where intermittent damage is occurring and it is not feasible or practical for WS to provide operational assistance, WS could recommend to the USFWS the issuance of a DP to the resource owner (WS Directive 2.301). Any take of a MBTA protected birds without the proper state and Federal permits is a violation of state and Federal law. Table 1-1 provides information on the number of requests for assistance WS received in fiscal years (FY) 03, 04, 05, and 06 for bird damage management, the number of DPs WS recommended and forwarded to the USFWS (Management Information System (MIS) 2003, 2004, 2005, 2006).

DPs are necessary under the MBTA and Bald and Golden Eagle Protection Act (BGEPA) for activities which *"take"* protected species. DPs are not necessary for non-lethal harassment of species protected only under MBTA, but are required for species protected under the BGEPA. Additionally, any *"take"* of a threatened or endangered (T/E) species (which could be protected

[4] 50 CFR 21 provides for certain exceptions to permit requirements for public, scientific, or educational institutions, and establishes depredation orders (DO) (50 CFR 21.42) which provide limited exceptions to the MBTA (1 6 U.S.C . 703-71 2).

under MBTA, BGEPA and the ESA) could require multiple permits under all three Acts.

1.2.3 Federal Aviation Administration

The FAA is the federal agency responsible for developing and enforcing air transportation safety regulations and is authorized to reduce wildlife hazards at commercial and non-commercial airports. Many of these regulations are codified in the Federal Aviation Regulations (FAR). The FAA is responsible for setting and enforcing the FARs and policies to enhance public safety. For commercial airports, 14CFR, Part 139.337 (Wildlife Hazard Management) directs the airport sponsor to conduct a wildlife hazard assessment if an air carrier aircraft experiences multiple wildlife strikes or an air carrier aircraft experiences substantial damage from striking wildlife. At non-commercial airports, the FAA also expects that the airport be aware of wildlife hazards in and around their airport and take corrective action if warranted; the FAA uses Advisory Circular 150/5200-33 to guide their decision making process.

Table 1-1. Requests for Technical Assistance and DP Recommended by WS by FY.

FY	Resource Protected	Requests	DP Recommended
03	Agriculture	6	0
	Health & Safety	187	5
	Natural Resources	50	12
	Property	12	2
04	Agriculture	19	0
	Health & Safety	310	5
	Natural Resources	27	7
	Property	24	0
05	Agriculture	28	0
	Health & Safety	257	5
	Natural Resources	7	3
	Property	69	1
06	Agriculture	24	0
	Health & Safety	243	5
	Natural Resources	10	4
	Property	83	3

1.2.4 U.S. Air Force

The mission of the USAF is to defend the United States and its global interests -- to fly and fight in air, space, and cyberspace. To achieve that mission, the USAF has a duty of global vigilance, reach and power. That vision focuses around three core competencies: 1) developing airmen, 2) technology-to-warfighting, and 3) integrating operations. These core competencies make six distinctive capabilities possible: 1) air and space superiority, 2) global attack, 3) rapid global mobility, 4) precision engagement, 5) information superiority, and 6) agile combat support.

Offutt Air Force Base is home to the headquarters of the United States Strategic Command, the Air Force Weather Agency, and the 55th Wing, the Fightin' Fifty-Fifth, and a variety of other important units. Offutt's diverse missions and global responsibilities put it on the cutting edge of the Air Force's transformation. Each branch of the U.S. military is represented among the approximately 12,000 military and federal employees assigned at Offutt Air Force Base.

The 55th Communications Group provides worldwide command, control, communications and computer systems, information management and combat support to war fighting and national leadership. It also provides communications technology and support to the 55th Wing and 44 tenant units. The 55th Maintenance Operations Squadron provides centralized direction of all maintenance staff functions providing support to world-wide aircraft reconnaissance missions.

Offutt Air Force Base's Bird/Wildlife Aircraft Strike Hazard (BASH) Team's goal is the preservation of warfighting capabilities through the reduction of wildlife hazards to aircraft operation. BASH is responsible for developing research programs to reduce bird strike potential and manages the largest bird strike database (http://www.afsc.af.mil/organizations/bash/index.asp). Additionally, Offutt uses NEXRAD (WSR-88D) Weather Radars to track the movements of birds; Aviation Hazard Advisory Systems represents the most comprehensive method of remote sensing of birds today. The system is used to keep airplanes away from birds by monitoring bird activity in near real-time.

1.3 PURPOSE OF THE EA

The purpose for preparing this EA is to determine if the proposed action could have a significant impact on the quality of the human environment, analyze other alternatives, coordinate efforts, inform the public of the proposed action, and to comply with NEPA. This EA analyzes the potential effects of human/bird conflict reduction actions (*i.e*., bird damage management), as coordinated with the USFWS, FAA, USAF, NGPC, NDA and UNLE, and other State and Federal agencies, and private entities on all lands in Nebraska under MOU, Cooperative Agreement, or other comparable document. The EA also addresses the effects of human/bird conflict reduction actions in areas where additional agreements may be signed in the future. Because the current program and the proposed action are to conduct a coordinated human/bird conflict reduction program in accordance with plans, goals, and objectives developed by WS, USFWS, FAA, USAF, NGPC, NDA and/or UNLE to reduce damage, and because the program's goals and directives are to provide services when requested, within the constraints of available funding and workforce, it is conceivable that additional damage management efforts could occur[5]. Thus, this EA anticipates these additional efforts and the analyses are intended to apply to actions that may occur *in any locale* and at *any time* within Nebraska as part of a coordinated program.

The purpose of WS', the USFWS's, FAA's USAF's, NGPC's , NDA's and UNLE's human/bird conflict reduction program in Nebraska is to minimize bird damage to animal and human health and safety (*e.g.,* disease transmission, aircraft/bird strikes), agriculture (*e.g.,* crops, domestic animals), aquaculture, property (*e.g*., structures), and natural resources (*e.g.,* T/E species). It is anticipated, based on historical information, that the majority of Nebraska WS' bird damage management will be at airports to reduce potential aircraft/bird strikes and to protection property, at livestock facilities, ethanol plants and urbanized areas to reduce European starling (*Sturnus vulgaris*) feed consumption and fecal contamination, and reduce potential risk of disease transmission.

WS', USFWS's and NGPC's involvement in bird damage management provides residents of Nebraska measures to facilitate swift and more effective program delivery. Under the Proposed Action, human/bird conflict reduction could be conducted under cooperative agreements, MOU or other comparable documents on private, Federal, State, tribal, county, and municipal lands in Nebraska upon request for WS assistance and in coordination with the NGPC, USFWS, and tribal governments when requests for operational assistance are received, as appropriate. During FY 03, 04, 05, and 06, Nebraska WS technical assistance was requested on 255, 380, 361, and 360 occasions, respectively when birds were damaging agricultural resources, property or natural resources and/or threatening human health/safety (Table 1-1) (MIS 2003,2004, 2005, and 2006). WS' roles would be coordinated with the USFWS, FAA, USAF, NGPC, NDA and UNLE, as appropriate and consistent with other uses of the area.

This EA evaluates alternatives by which the bird damage management responsibility of Nebraska WS, the USFWS, FAA, USAF, NGPC, NDA and UNLE could be conducted to resolve bird conflicts. The EA

[5] All Migratory Bird Treaty Act (MBTA) protected birds may be removed under permits or Depredation Orders (DO) issued by the U.S. Fish and Wildlife Service (USFWS), as appropriate.

analyzes identified issues and alternatives and the impacts are expected. WS identified 46 bird species for which they have received requests for assistance or information, or have provided operational bird damage management service (Table 1-2)[6]. The species analyzed in this EA include the following: European Starling[7], Red-winged Blackbird (*Agelaius phoeniceus*), Common Grackle (*Quiscalus quiscula*), Brown-headed Cowbird (*Molothrus ater*), American Crow (*Corvus brachyrhynchos*), Double-crested Cormorant (*Phalacrocorax auritus*), Mourning Dove (*Zenaida macroura*), Ring-necked Pheasant[8] (*Phasianus colchicus*) American Coot (*Fulica americana*), Mallard (domestic/wild) (*Anas platyrhynchos*), Gadwall (*A. strepera),* Northern Shoveler (*A. clypeata),* Northern Pintail (*A. acuta),* Green-winged Teal (*A. crecca),* Blue-winged Teal (*A. discors*), Wood Duck (*Aix sponsa),* Canada Goose (*Branta canadensis),* Bald Eagle (*Haliaeetus leucocephalus*), American Kestrel (*Falco sparverius*), Cooper's Hawk (*Accipiter cooperii*), Sharp-shinned Hawk (*A. striatus),* Red-tailed Hawk (*Buteo jamaicensis*), Swainson's Hawk (*B. swainsoni),* Northern Harrier (*Circus cyaneus),* Short-eared Owl (*Asio flammeus),* Great horned Owl (*Bubo virginianus*), Common Nighthawk (*Chordeiles minor),* Franklin's Gull (*Larus pipixcan),* Ring-billed Gull (*L. delawarensis*), Great Blue Heron (*Ardea herodias),* Cattle Egret (*Bubulcus ibis),* Killdeer (*Charadrius vociferous*), Pied-billed Grebe (*Podilymbus podiceps),* Upland Sandpiper (*Bartramia longicauda),* Eastern Meadowlark (*Sturnella magna),* Western Meadowlark (*S. neglecta*), Rock Dove[3] (feral pigeon) (*Columba livia*), American Robin (*Turdus migratorius*), House Sparrow[3] (*Passer domesticus*), Barn Swallow (*Hirundo rustica*), Cliff Swallow (*H. pyrrhonota*), Tree Swallow (*Tachycineta bicolor*), Northern Flicker (*Colaptes auratus*), Downy Woodpecker (*Picoides pubescens*), Wild Turkey[8] (*Meleagris gallopavo*), Turkey Vulture (*Cathartes aura*), and feral, domestic and exotic birds.

For emergency situations involving the protection of human health and safety (*e.g.,* bird/aircraft strikes), WS may take individuals of additional non-threatened and non-endangered species not listed in Table 1-2. These takes would occur on a case-by-case basis and are not anticipated to exceed the protocol established via the USFWS Migratory Bird DP (permit # WS State Office MB714685-1, Eppley MB834783-0, Lincoln Airport MB811063-0, Offutt MB820488-2, Bald Eagle Hazing MB 101290-0). As future conflicts arise with bird species not listed in this EA, those species will be addressed with appropriate NEPA analysis and documentation.

1.4 NEED FOR ACTION

1.4.1 Need for Bird Damage Management to Protect Human Health and Safety; Livestock Health; and Property

1.4.1.1 Human Health and Safety. Certain bird species are known vectors of diseases (zoonoses) that are transmittable to humans or they act as reservoirs that infect a host that spreads the disease to humans (Table 1-3) (Weber 1979, Conover 2002). Starlings, Pigeons, House Sparrows, and waterfowl are a few species that are carriers of different zoonotic diseases that have been contracted by humans. In addition, soils that are enriched by bird droppings, usually by Blackbirds, Starlings, Gulls and Pigeons, have a tendency to promote the growth of the fungus, *Histoplasmosis capsulatum,* which is endemic to the U.S. (Southern 1986, Cleary et al. 1996). When disturbed, fungal spores become airborne and if inhaled may cause the respiratory disease Histoplasmosis. Workers at an ethanol plant in eastern Nebraska became ill with

[6] Activities on species not listed in Table 1-2 were primarily conducted for Avian Influenza surveillance and aircraft-bird strike risk reduction at airports.

[7] It should be noted that Starlings, House sparrows and Pigeons are considered non-indigenous, invasive species, and because of their negative impacts and competition with native birds, are considered by many wildlife biologists and ornithologists to be an undesirable component of North American wild and native ecosystems. These three species are not protected by MBTA or state law. Any population reduction of these species in North America could be considered beneficial to native bird species.

[8] Ring-necked pheasants and wild turkeys are managed by the state and not protected by MBTA.

Histoplasmosis after breathing in spores from construction in an area that had a Starling roost (Mortality and Morbidity Weekly Report (MMWR) 2004). Ornithosis (*Chlamydia psittaci*) is another respiratory disease that can be contracted by humans, livestock, and pets. Pigeons are most commonly associated with the spread of Ornithosis to humans. Ornithosis is a virus that is spread through infected bird droppings when viral particles become airborne after infected bird droppings are disturbed. Various bird species are known reservoirs for the *Flavivirus* spp., the organism responsible for the recent outbreaks of West Nile Virus (WNV) in the U.S.

Table 1-2. Species and Resources that WS Routinely Receives Requests for Assistance.

Species	Protected Resource					
	Human Health & Safety (Aviation)	Agriculture (Aquaculture)	Agriculture (Field Crops)	Livestock (Feed or Animal Health)	Property (Building, Structure)	Turf
Blackbird, Red-winged	X		X	X	X	
Coot, American	X					
Cormorant, Double-crested	X	X				
Cowbird, Brown-Headed	X			X	X	
Crow, American	X			X	X	
Dove, Mourning	X					
Duck, Mallard	X					
Duck, Teal, Blue-winged	X					
Eagle, Bald	X					
Falcon, American Kestrels	X					
Goose, Canada	X					X
Grackle, Common	X					
Gull, Franklin's	X					
Gull, Ring-billed	X					
Hawk, Cooper's	X					
Hawk, Red-tailed	X					
Hawk, Sharp-shinned	X					
Heron, Great Blue	X	X				
Killdeer	X					
Meadowlark, Eastern	X					
Meadowlark, Western	X					
Owl, Great Horned	X					
Pigeon, Feral (Rock)	X			X	X	
Robin, American	X					
Sparrow, House/English	X			X	X	
Starling, European	X			X	X	
Swallow, Barn	X				X	
Swallow, Cliff	X				X	
Swallow, Tree	X					
Turkey, Wild	X					
Vulture, Turkey	X			X		
Woodpecker, Downy					X	

Table 1-3. Diseases transmissible to humans and livestock associated with feral domestic pigeons, starlings, and sparrows (Weber 1979).

Disease	Human Symptoms	Potential for Human Fatality	Effects on Domestic Animals
Bacterial:			
Erysipeloid	skin eruption with pain, itching; headaches, chills, joint pain, prostration, fever, vomiting	sometimes - particularly to young children, old or infirm people	serious hazard for the swine industry
Salmonellosis	gastroenteritis, septicemia, persistent infection	possible, especially in individuals weakened by other disease or old age	causes abortions in mature cattle, possible mortality in calves, decrease in milk production in dairy cattle
Pasteurellosis	respiratory infection, nasal discharge, conjunctivitis, bronchitis, pneumonia, appendicitis, urinary bladder inflammation, abscessed wound infections	Rarely	may fatally affect chickens, turkeys and other fowl
Listeriosis	conjunctivitis, skin infections, meningitis in newborns, abortions, premature delivery, stillbirth	sometimes - particularly with newborns	In cattle, sheep, and goats, difficulty swallowing, nasal discharge, paralysis of throat and facial muscles
Viral:			
Meningitis	inflammation of membranes covering the brain , dizziness, and nervous movements	possible — can also result as a secondary infection with listeriosis, salmonellosis, cryptococcosis	causes middle ear infection in swine, dogs, and cats
Encephalitis (7 forms)	headache, fever, stiff neck, vomiting, nausea, drowsiness, disorientation	mortality rate for eastern equine encephalomyelitis may be around 60%	may cause mental retardation, convulsions and paralysis
Mycotic (fungal):			
Aspergillosis	affects lungs and broken skin, toxins poison blood, nerves, and body cells	not usually	causes abortions in cattle
Blastomycosis	weight loss, fever, cough, bloody sputum and chest pains.	Rarely	affects horses, dogs and cats
Candidiasis	infection of skin, fingernails, mouth, respiratory system, intestines, and urogenital tract	Rarely	causes mastitis, diarrhea, vaginal discharge and aborted fetuses in cattle
Cryptococcosis	lung infection, cough, chest pain, weight loss, fever or dizziness, also causes meningitis	possible especially with meningitis	chronic mastitis in cattle, decreased milk flow and appetite loss
Histoplasmosis	pulmonary or respiratory disease. May affect vision	possible, especially in infants and young children or if disease disseminates to the blood and bone marrow	actively grows and multiplies in soil and remains active long after birds have departed
Protozoal:			
American Trypanosomiasis	infection of mucous membranes of eyes or nose, swelling	possible death in 2-4 weeks	caused by the conenose bug found on pigeons
Toxoplasmosis	inflammation of the retina, headaches, fever, drowsiness, pneumonia, strabismus, blindness, hydrocephalus, epilepsy, and deafness	possible	may cause abortion or still birth in humans, mental retardation
Rickettsial/ Chlamydial:			
Chlamydiosis	pneumonia, flu-like respiratory infection, high fever, chills, loss of appetite, cough, severe headaches, generalized aches pains, vomiting, diarrhea, hepatitis, insomnia, restlessness, low pulse rate	occasionally, restricted to old, weak or those with concurrent diseases	in cattle, may result in abortion, arthritis, conjunctivitis, and enteritis
Q Fever	sudden pneumonitis, chills, fever, weakness, severe sweating, chest pain, severe headaches and sore eyes	Possible	may cause abortions in sheep and goats

Detecting contamination is relatively simple compared to the challenge of identifying where such contamination may originate. Fecal coliforms and *E. coli* are bacteria commonly used in water quality testing to detect fecal pollution. These organisms are present in high numbers in the gastrointestinal tract of almost all warm-blooded animals, and are therefore easy to detect in feces-contaminated water. Fecal coliforms and *E. coli* generally do not pose the actual health risk, but rather demonstrate the presence of fecal matter, which may carry numerous pathogenic

(disease causing) organisms. The U.S. Environmental Protection Agency (EPA) has determined that if levels of *E. coli* exceed 235 organisms (Colony Forming Unit) per 100 mL of water, a health risk to humans may exist and recreational waters should be closed to the public.

Disease transmission by free-ranging birds, such as Canada geese, Blackbirds and Pigeons is of increasing concern in the areas of public health and safety and agricultural production. Rapidly increasing populations of urban Canada geese are contaminating recreational areas with pathogenic bacteria (*i.e., E. coli*) that may pose human-health risks (http://www.aphis.usda.gov/ws/researchreports/report06.pdf).

Birds may also be responsible for creating human health and safety concerns that are not related to the aviation hazards or transmission of zoonotic diseases. For example, Nebraska WS receives calls from residents and golf course managers concerning the aggressive nature of nesting Canada Geese or Wild Turkeys that have become semi-domesticated and exhibit aggressive behavior towards people.

WS received 11, 9, 58 and 105 requests for information or assistance during FY03, 04, 05 and 06, respectively, concerning potential affects of zoonotic disease transmission by birds or direct threats to humans from birds (MIS 2003, 2004, 2005, and 2006).

1.4.1.2 Human Health and Safety (Aviation). The FAA is responsible for setting and enforcing the FARs and policies to enhance public safety. For commercial airports, 14CFR, Part 139.337 (Wildlife Hazard Management) directs the airport sponsor to conduct a wildlife hazard assessment if an air carrier aircraft experiences multiple wildlife strikes[9] or an air carrier aircraft suffers substantial damage from striking wildlife. Airports involved in wildlife hazard management usually refer to "Wildlife Hazard Management at Airports" guidebook for conducting surveys or assessing potential wildlife risks at airports.

Bird hazards to aircraft and subsequent risks to public safety represent a serious concern about how wildlife can affect human health and safety (Figure 1-1). During the early days of aviation, when aircraft flew at slower speeds, wildlife had little difficulty getting out of the way of the aircraft. However, the evolution of aircraft design has resulted in faster and quieter aircraft. The rapid acceleration and increased speeds of jet turbine and modern propeller driven aircraft give birds less time to react to approaching aircraft. Further, longer runways and more complete use of runways by jet aircraft also increase the risk of strikes. The energy released as a result of a high-speed aircraft-wildlife collision is tremendous, especially to technologically advanced turbine engines that use lightweight, high speed mechanical parts. Also the amount of air traffic has increased substantially during the last two decades increasing wildlife strike risks. In 1990 there were roughly 1,750 reported wildlife strikes compared to more than 4,500 in 1999 in the U.S. (Cleary et al. 2002). Between 1990 and 1999 there were 2,492 wildlife strikes in the U.S. that caused damage to aircraft, of these 85% were caused by birds (Cleary et al. 2002).

Aircraft-wildlife strikes are the second leading causes of aviation-related fatalities. Globally, these strikes have killed more than 400 people and destroyed more than 420 aircraft. While these events are rare when compared to the millions of aircraft operations, the potential for catastrophic loss of human life and property resulting from one incident is substantial. Depending on the force of the impact, the strike may damage or even destroy components of the aircraft, or injure or kill

[9] The collision of an animal with aircraft is commonly referred to as a "strike." The definition of a wildlife strike was developed by the Bird Strike Committee Canada and has been endorsed by the International Civil Aviation Organization (ICAO), Bird Strike Committee USA, Bird Strike Committee Europe, the FAA, the USAF, and most airports throughout the United States (Transport Canada 1992).

people in the aircraft. High speed modern jet engine aircraft produce enormous amounts of energy and speed, and a wildlife strike may cause substantial damage[10] or even a total catastrophic failure to the aircraft[11]. Flocks of birds are especially dangerous when in an airport proper, and can lead to multiple strikes and damage within seconds. Depending on the damage, aircraft at low altitudes or during take off and landing often cannot recover in time and crash.

A high percentage of bird strikes occur during peak migration periods, but dangerous situations can develop anytime. Aircraft are most vulnerable to bird strikes when at low altitudes, generally related to landing and taking off. Approximately 55% of strikes occur below 600 feet above ground level (AGL) which is why management of the area immediately surrounding taxiways, runways, and runway approaches is vital and approximately 90% of aircraft-bird strikes occur on or near airports, when aircraft are below altitudes of 2,000 feet[12] (Cleary et al. 2000). Aircraft-bird strikes at low elevations are especially dangerous because aircraft are moving at high speeds and are close to or on the ground and crews have minimal time and space to recover from aircraft-bird strikes putting them and aircraft in jeopardy. Aircrews are focused on complex take-off or landing procedures and monitoring the movements of other aircraft in the airport vicinity. Aircrew attention to these activities while at low altitudes often compromises their ability to successfully recover from unexpected wildlife collisions and to deal with rapidly changing flight procedures. However, bird strikes have also been reported at high altitudes, some as high as 18,000 to 27,000 feet AGL.

Figure 1-1. Canadair CL-600 March 9, 2002 Strike

Air Reldan Duck Strike Lakefront Airport, LA - March 9, 2003

Nr 8 - PA-28 Warrior - 10/6/99 - Atlantic City American bitten struck wing

[10] "Substantial damage occurs when the aircraft incurs damage or structural failure which adversely affects the structural strength, performance or flight characteristics of the aircraft and which would normally require major repair or replacement of the affected component" (ICAO).

[11] The impact of a 12 pound bird at 150 mph equals a 1000 pound weight dropped from a height of 10 feet.

[12] According to the FAA wildlife hazard management manual for 2005, less than 8% of strikes occur above 3,000 feet and 61% occur at less than 100 feet.

The risk that wildlife poses to aircraft is well documented with Orville Wright first reporting a bird strike in 1905. The first recorded bird strike fatality was reported on April 3, 1912, at Long Beach, California when aero-pioneer Cal Rodgers collided with a Gull (*Larus* spp.). The impact broke a guy wire which jammed the aircraft controls of his model EX Wright Pusher airplane. He crashed, was pinned under the wreckage and drowned.

The greatest loss of life directly linked to a bird strike was on October 4, 1960, when Eastern Air Lines Flight 375, a Lockheed L-188 Electra, flying from Boston, flew through a flock of Starlings during take off, damaging all four engines. The plane crashed shortly after take-off into Boston harbor, killing 62 people. Subsequently, minimum bird ingestion standards for jet engines were developed (Cleary and Dolbeer 1999). More recently, 24 lives were lost when an E-3B "AWACS" aircraft struck a flock of Canada Geese at Elmendorf, Alaska in 1995. Further, the Space Shuttle Discovery also hit a bird during take-off on July 26, 2005, however at lower speeds with no obvious damage to the shuttle occurred. National Aeronautics and Space Administration, however, lost an astronaut, Theodore Freeman, to a bird strike; he was killed when a goose shattered the plexi-glass cockpit of his T-38 trainer, resulting in shards being ingested by the engines leading to a fatal crash.

The following recent aviation accidents caused by bird strikes further demonstrates the serious impacts that birds can have on aviation safety (Wright 2008):

Burke Lakefront – Ohio

May 8, 2002-A Beechjet 400 aborted take-off after striking a flock of Ring-billed and Herring Gulls on take-off. Both engines ingested Gulls and were damaged. One engine had an uncontained failure. The aircraft was towed back to the hangar and 14 Gull carcasses were recovered. Estimated cost was $600,000.

Dallas-Fort Worth – Texas

February 24, 2002-An FK-1000 struck a flock of White-fronted Geese (*Anser albifrons*), ingesting one goose shortly after take-off. The pilot made a precautionary landing. The engine, nose, and wing of the aircraft were damaged. One engine was replaced. The cost of repairs and lost revenues totaled $654,000. The aircraft was out of service for 8 days.

Denver International – Colorado

January 26, 2002-A Boeing 757 struck a Great Horned Owl during take-off, requiring a precautionary landing after the pilot reported engine vibration. Several fan blades on the engine were damaged and feathers were found in the engine. Damage and costs were estimated at $500,000. The aircraft was out of operation for 3 days.

Detroit Metropolitan – Michigan

December 6, 2001-A Boeing 737 struck a flock of Gulls and ingested one shortly after take-off. The engine flamed out, forcing an emergency landing. The engine was replaced. Costs were estimated at $2.3 million.

Memphis International – Tennessee

November 20, 2001-A Boeing 727 struck a flock of Snow Geese (*Chen caerulescens*) on approach. At least three Geese impacted the aircraft, one shattering the cockpit windshield and two penetrating the right wing near the leading edge slats. Cost of repairs and lost revenue was $700,000. The aircraft was out of service for 7 days.

Lakefront – Louisiana

November 3, 2001-A Cessna Citation II struck a flock of ducks shortly after take-off. The pilot made a precautionary landing. The engine inlet and inlet fan were damaged and the right wing was damaged. Cost of repairs totaled $605,000 and the aircraft was out of service for 30 days.

John F. Kennedy Airport – New York

June 3, 1995-A Concorde ingested a Canada Goose on touchdown into the #3 engine, which had an uncontained failure causing parts to go into the #4 engine. Both engines

were destroyed. Flames and smoke were seen coming from both engines. Cost was more than $9 million and the aircraft was out of service for 5 days. The New York Port Authority paid $5.3 million in compensation for losses.

The FAA and the USAF maintain a database which contains information on more than 54,000 reported United States civilian and military aircraft-wildlife strikes between 1990 and 1999. During that decade, the FAA received reports indicating that aircraft-wildlife strikes, damaged 4,500 civilian U.S. aircraft (1,500 substantially), destroyed 19 aircraft, injured 91 people, and killed 6 people. Additionally, there were 216 incidents where birds struck two or more engines on civilian aircraft, with damage occurring to 26% of the 449 engines involved in these incidents. The FAA estimates that during the same decade, aircraft sustained $4 billion worth of damages and associated losses and 4.7 million hours of aircraft downtime due to aircraft-wildlife strikes. For the same period, FAA estimates that the 28,150 aircraft-wildlife strike reports it received represent less than 20% of the actual number of strikes that occurred during the decade. USAF planes colliding with wildlife resulted in 10 Class A Mishaps, 26 airmen deaths, and over $217 million in damages. The combined military services report an average of 2,600 bird strikes annually (Cleary and Dolbeer 1999).

The number of airports requesting assistance from WS nationwide with wildlife issues has increased from less than 50 in 1990 to more than 400 in 2000 (Cleary et al. 2002). Increasing bird and mammal populations in urban and suburban areas near airports contribute to escalating aircraft-wildlife strike risk and rates. FAA, USAF, and WS experts expect the risks, frequencies, and potential severities of aircraft-wildlife strikes to increase during the next decade as the numbers of aircraft operations increase to meet expanding transportation and military demands (Cleary et al. 2000).

According to FAA records, 157 bird strikes to civil aircraft were reported in Nebraska in CY06 (FAA database, wildlife.pr.erau.edu/public/ index1.html). Of those strikes reported to commercial aircraft, 57 strikes were from unknown species and Mourning Doves accounted for 11; the number of bird strikes to military aircraft in Nebraska is unavailable. However, it is estimated that only 20 to 25% of all bird strikes are reported (Conover et al. 1995, Dolbeer et al. 1995, Linnell et al. 1996, Linnell et al. 1999), consequently, the number of bird strikes in Nebraska is most likely much higher than FAA records indicate.

During FY05 an aircraft struck a Canada goose at a military airport in Nebraska causing approximately $8,000,000 worth of damage to the aircraft (MIS 2005). In FY06 an aircraft struck a Canada goose at a eastern Nebraska airport causing about $6,600 in damage to the aircraft (MIS 2006). Therefore, WS has been providing assistance to airports in Nebraska to resolve conflicts between wildlife and aviation traffic and to protect the traveling public. WS has written three wildlife hazard management plans for different airports and four formal wildlife hazard assessments that provided airports with the necessary information to identify problematic species, seasonal trends in species abundance, abatement recommendation, and legalities surrounding the management of these species. As wildlife/aviation hazards are identified at different airports throughout Nebraska the number of requests for assistance may increase. WS either verified or had reported 176, 301, 199, and 138 threats-wildlife strikes to aviation traffic from a variety of species in FY03, 04, 05 and 06, respectively (MIS 2003, 2004, 2005, 2006) with a total loss during this period of $16,784,770. The bird species discussed/analyzed in this EA occur in Nebraska and could occur on most airports in Nebraska. If these birds present an aircraft/bird strike hazard or potential hazard, WS would respond with appropriate actions. Those actions could be non-lethal or lethal depending on the case-by-case situation as evaluated by WS and airport personnel and authorized by WS migratory bird permits issued by the USFWS.

Obviously, collisions between aircraft and wildlife are a concern in the U.S. and at Nebraska airports because they threaten crew and passenger safety (Thorpe 1996), result in lost revenue and costly repairs to or loss of aircraft (Milsom and Horton 1990, Linnell et al. 1996, Robinson 1997), and erode public confidence (Conover et al. 1995). While wildlife-aircraft strikes that result in human fatalities are rare[13], the consequences can be catastrophic.

1.4.2 Need for Bird Damage Management to Protect Agricultural Resources.

1.4.2.1 Livestock Feeds. Bird damage to agricultural crops has cost U.S. farmers more than $100 million annually (Besser 1985) and can pose significant economic threats to agricultural producers (Besser et al. 1968, Dolbeer et al. 1978, Feare 1984). As the science of raising cattle progressed from range to feedlots, bird problems intensified. Cattle in feedlots and dairies provide a tremendous feeding opportunity for birds. Along with modern agriculture facilities came the concept of the complete cattle diet. The complete diet contains all the nutrients and fiber that cattle need to increase weights, produce milk, and improve the flavor and texture of meat. The basic constituent of most rations is silage with the addition of barley, corn, or other grains which may be incorporated as whole, crushed or ground grains. The silage/grain mixture is normally combined with hay, or other high fiber roughage. While cattle are not able to select for certain ingredients, Starlings and other birds select for grains, or other items, thereby altering the composition and energy value of the feed.

Livestock feed losses to Starlings, Feral Pigeons and Crows and mixed Blackbirds have been estimated by Besser et al. (1968) in feedlots near Denver, Colorado at $84 per 1,000 birds. Forbes (1995) reported Starlings consume up to 50% of their body weight each day. Glahn and Otis (1981) reported consumption of about 10.5 lbs of pelletized feed per 1,000 bird minutes. The removal of high energy food ingredients is believed to reduce weight gains, milk yields, and is economically significant to individual producers (Feare 1984).

From FY03 thru FY06 WS responded to 5, 10, 15, and 16 respectively, requests for assistance from agriculture producers that were concerned about Starlings consuming livestock feed or spreading diseases to livestock (MIS 2003, 2004, 2005, 2006). Also the value of verified and reported contaminated or consumed livestock feed during FY 03 was 11, 000; $12,000 in FY 04; $31,500 in FY 05, and $3,890 in FY 06 (MIS 2003, 2004, 2005, 2006). Because livestock producers are becoming more aware of the Nebraska WS program, the number of complaints received by WS is expected to increase.

1.4.2.2 Aquaculture Resources. Bird damage to aquaculture resources can have significant economical impacts. In addition to direct losses through consumption, disease transmission from wild fish populations to aquaculture facilities or between aquaculture facilities may pose an economic risk to fish hatcheries Glahn and King 2004).

The greatest economic losses result from Double-crested Cormorants feeding on channel catfish (*Ictalurus punctatus)* at aquaculture facilities in the southeastern United States. Stickley and Andrews (1989) estimated that Mississippi catfish farmers lose in excess of $3 million dollars annually to Double-crested Cormorants. In response to Double-crested Cormorants population expansion during the past 25 years, the USFWS has implemented a Public Resources Depredation Order (CFR 21.48) and an Aquaculture Resources Depredation Orders[14] (50 CFR 21.47)

[13] It is more common for wildlife-aircraft strikes to result in expensive repairs, flight delays, or aborted aircraft movements.

[14] The Depredation Orders (50 CFR 21.47 and 21.48) do not apply to Nebraska, but is referred to as background information for the reader.

modifying the legal protection for Double-crested Cormorants. Wading birds including Herons and Egrets (Family *Ardeidae*) also cause significant economic losses to aquaculture production facilities. Hoy et al. (1989) estimated that wading birds feeding at a minnow facility may consume $0.10 to $1.12 per bird which could translate into a loss in the thousands of dollars. In a survey of fish hatcheries in the eastern United States, Parkhurst et al. (1987) estimated that most hatcheries lost in excess of $7,600 worth of fish production to bird predation annually. In addition to direct losses through consumption, disease transmission from wild fish populations to aquaculture facilities or between aquaculture facilities may pose an economic risk to fish hatcheries.

During FY 03, 04, 05, and 06, WS received requests for assistance from 52, 27, 7 and 10, respectively, from State and private hatcheries, and commercial fishing facilities who reported various species of birds were depredating fish at aquaculture facilities. The total value of depredated aquaculture resources for the 4-year analysis period was valued at more than $450,115 (MIS 2003, 2004, 2005, 2006). Double-crested Cormorants and Great Blue Herons were reported as the species that caused most depredation problems in Nebraska (MIS 2003, 2004, 2005, 2006).

1.4.2.3 Field Crops. Waterfowl, Sandhill Cranes (*Grus canadensis*), Canada Geese, Turkeys, and Blackbirds can cause considerable damage to field crops. The amount of damage and subsequent monetary losses vary considerably each year based upon seasonal variations in migrations, spatial differences in crop placement, and temporal differences affecting planting and harvesting dates. Cleary et al. (1996) in "The Prevention and Control of Wildlife Damage" reported that waterfowl caused an estimated $12.6 million of damage in 1960 to small grains in the Canadian Prairie Provinces. In 1980 waterfowl were implicated in damaging $454,000 worth of small grains in North Dakota. Blackbirds routinely damage seeded and headed rice in Louisiana (Glahn and Wilson 1992) and headed sunflowers in the Dakotas (Linz et al. 1984, Homan et al. 1994, Linz and Hanzel 1997). Sandhill Cranes can also do significant damage to corn and wheat fields. Blackbirds, Crows, and Blue Jays (*Cyancitta cristata*) routinely damage ripening sweet and field corn. Even a small amount of damage on an ear of sweet corn will render the ear worthless because most people will not purchase a damaged ear of corn (Conover 2002).

WS received two requests for assistance from farmers who reported Blackbirds were damaging crops valued at more than $12,150 during FY 04 (MIS 2004). During FY06 WS received or verified four cases where Blackbirds were damaging field crops with an estimated damage value exceeding $3,350 dollars (MIS 2006).

1.4.2.3 Livestock Health. Pigeons, Starlings, Sparrows, Crows, and Blackbirds have been implicated in the transmission of diseases significant to livestock production (Table 1-3). Pigeons and Starlings have been shown to be vectors of transmissible gastroenteritis virus of swine. This disease is usually fatal to young pigs and may result in weight loss for adults. The cost associated with Starlings in the spread of livestock disease may at times be substantial. For example, during severe winter of 1978-1979, a transmissible gastroenteritis outbreak occurred in southeast Nebraska, with more than 10,000 pigs lost in 1 month in Gage County alone. Starlings were implicated because the transmissible gastroenteritis outbreak was concurrent with large flocks of Starlings feeding at the same facilities (Johnson and Glahn 1994). The virus can remain alive on their feet and feathers for up to 30 hours resulting in the spread of transmissible gastroenteritis between livestock facilities. Starlings also may be involved in the transmission of hog cholera.

The northern fowl mite found on Pigeons is an important poultry pest. In addition to the spread of zoonotic diseases to livestock, WS also receives requests for assistance concerning birds of

prey depredating domestic fowl.

WS received requests for assistance from ranchers and feedlot managers who were concerned about Starlings transmitting diseases to cattle, horses and/or swine. The number of requests for assistance to reduce Starling damage or potential damage at livestock facilities is expected to increase during the next several years. WS received 1, 7, 12 and 3 requests during FY 03, 04, 05 and 06, respectively, to help protect livestock health ($7,900 in FY04 and 5,000 in FY06) or prevent predation of domestic fowl/game birds, and in FY05 and FY06 a zoo requested WS assistance to reduce risks of disease transmission to zoo animals (MIS 2003, 2004, 2005, 2006).

1.4.2.4 Property. Property damage caused by birds can entail numerous resources and usually is not important nationally but may be significant on a local or regional basis. Woodpecker damage to residential dwellings from a national perspective is minimal; however, from a local perspective may cause home owners thousands of dollars in related damages. Instances of property damage from birds may consist of barn swallow nests under eaves and bridges or bird droppings defacing property. In another instance, the Nebraska Department of Roads (NDOR) reported that Cliff and Barn Swallows cost the NDOR $160,000 by delaying major reconstruction of a bridge (O. Claude, NDOR, pers. comm. 2008). The delay was a result of compliance with the MBTA which provides protection for the above mentioned birds. WS received 2, 8, 22, and 15 requests for assistance concerning bird damage to roads, bridges, and utilities in FY 03, 04, 05, and 06 with reported and verified damages totaling $298,000 (MIS 2003, 2004, 2005, 2006).

Golf Course Damage

Canada Geese have been causing damage at area golf courses for several years. Most golf courses that report damage, or request assistance occur in eastern Nebraska. Canada Geese cause large amounts of damage to the greens, fairways, and tee boxes, where they have become accustomed to foraging on the green grass, leaving large amounts of feces behind. The goose droppings diminish the aesthetic value of the course and continual cleaning operations over time cause damage to the fairways and greens. One golf course in eastern Nebraska reported geese causing $3,000 yearly in property damage and labor costs (R. Woods, WS, pers. comm. 2008). The geese also nest on and around the golf course, which causes issues with golfers coming into contact with aggressive geese. Golf course treatments have consisted of lethal and nonlethal methods to alleviate damage. WS responded to one requests for assistance in FY04 and 4 in FY05 with $500 total damage (MIS 2004, 2005).

Starling Damage in Omaha

Starlings began roosting in downtown Omaha, Nebraska during the fall of 2004. Roughly 25,000 starlings left the buildings and pedestrian walkways covered in feces up to several inches deep. Additionally the pedestrian walkways had to be power washed daily to prevent droppings being tracked into the buildings. Clean-up and maintenance of buildings increases substantially and the acidic nature of droppings can decrease the life of a building. Clean-up of the large accumulation of droppings resulted in a cost of $200,000 for one heavily damaged building (J. Thiele, WS, pers. comm. 2008).

Woodpecker Damage

Each year woodpeckers damage structures and cause economic losses to property owners in the U.S. (Craven 1984). This damage occurs when woodpeckers “drum,” a form of territorial display, and when they chisel holes in the sidewalls of structures and pull out the insulation to make a cavity (Evans et al. 1983, Graves and Andelt 1987, Marsh 1994). Damage usually occurs in the spring of the year which is concurrent with the breeding season. Woodpeckers can also cause severe damage to utility poles resulting in significant economic loss to utility companies.

Poles weakened by woodpecker damage reduce longevity, present a safety hazard, and may collapse under adverse conditions. In 1981 and 1982, the central Missouri Electric Corporation replaced 2,114 woodpecker damaged poles within their system at an approximate cost of $560,000 (Stemmerman 1988). During FY 03, Downy Woodpeckers in Nebraska were responsible for $2,000 damages to homes, and buildings.

1.4.3 Nuisances. Certain bird species and their associated nesting material and droppings may create nuisances or safety hazards. Cliff Swallows for instance may create a nuisance with their nests and droppings when they nest in large numbers on buildings or homes. Their nests may foul machinery, create aesthetic problems, and when they fall to the ground create similar problems. Pigeon and Starling droppings can deface signs and cause significant losses to sign companies attempting to maintain billboards. Accumulations of Pigeon and Starling droppings may produce an objectionable odor, accelerate deterioration of buildings and increase maintenance costs. Pigeon and Starling manure deposited on park benches, cars, statues, and unwary pedestrians is aesthetically displeasing. House Sparrows and Starlings may damage buildings by pecking foam insulation and create aesthetic problems with their droppings and nesting materials. They may also create fire hazards by placing nesting material near electrical wiring and light fixtures. From FY03 thru FY06 WS responded to 10, 15, 43, and 68 respectively, requests for assistance from property owners that were concerned about bird damage to their equipment and buildings (MIS 2003, 2004, 2005, 2006). Also the value of verified and reported damaged property during FY 03 was $2,725; $6,890 in FY 04; $15,000 in FY 05, and $11,100 in FY 06 (MIS 2003, 2004, 2005, 2006). As property owners become more aware of the Nebraska WS program, the number of complaints received by WS is expected to increase.

1.4.4 Natural Resources

Encroachment by some bird species is a concern of some resource management agencies. Starlings usurp nest sites from Wood Ducks, Bluebirds (*Sialia* spp.), Woodpeckers, and many other secondary cavity nesters (Grabill 1977, Weitzel 1988, Ingold 1989). Brown-headed Cowbirds parasitize songbird nests, leading to concern by some wildlife biologists for the well-being of neotropical migrant species (Brown 1994). With endangered bird species, such parasitism can cause enough nest failures to jeopardize the host species. Cowbirds have parasitized more than 220 host species, ranging from the Black-capped Vireo (*Vireo atricapillus*) and Wood Thrush (*Hylocichla mustelina*) to the Blue-winged Teal and Red-headed Woodpecker (*Melanerpes erythrocephalus*). Starlings may also parasitize the nests of other species by destroying eggs or hatchlings and possibly adults (Fielder et al. 1990, Grabill 1977, Peterson and Gauthier 1985).

The potential for Great Horned Owl predation on Piping Plover (*Charadrius melodus*) adults and chicks is also a concern to management agencies (Murphy et al. 2003). The population of Piping Plover in Nebraska is both federally and state-listed as threatened and in FY07 and FY08 Nebraska WS provided assistance to protect Piping Plover from Great-horned Owl predation.

Because of the predatory or invasive nature of some bird species, WS could foreseeably be requested to help reduce conflicts for the overall protection and conservation of some bird species. Any human-bird conflict reduction activities with birds protected by the MBTA would be conducted under the necessary permits and the conditions of the permits issued by NGPC and USFWS[15], or conducted under a DO, as appropriate.

[15] USFWS does not issue permits to take birds where competition or depredation on other species occurs (*e.g.*, raptors preying on gamebirds, piscivorous birds eating naturally occurring or stocked fish {other than aquaculture facilities}, and nest parasitism of non-listed species).

1.4.4.1 Avian Influenza Surveillance and Early Detection: A highly pathogenic strain of avian influenza (HPAI) has caused mortality in more than 40 species of wild birds in Asia, including Herons, Storks and Falcons. Millions of domestic poultry in Asia have either died or been killed because of outbreaks of the H5N1 strain of HPAI. There is growing concern that HPAI H5N1 may spread over a larger geographical area by infecting migratory waterfowl and shorebirds and evolve into a strain that could transmit between humans (USGS 2005).

Wild birds, especially waterfowl and shorebirds, are the natural reservoirs of influenza A viruses. The birds and the virus have coadapted; hence, infection does not usually cause overt disease in wild birds. If highly pathogenic H5N1 virus becomes established in North America, the likelihood of rapid spread across the continent is high. Avian influenza strains from wild birds usually cause mild, inapparent disease in domestic poultry and are designated low pathogenic avian influenza viruses. The virus can also change if a host is simultaneously infected with another type A influenza virus. In such situations, mixing of the genetic material from the two virus strains (genetic shift) can occur, resulting in the formation of a new strain; commercial poultry farms are ideal locations for avian influenza viruses to replicate efficiently. As the viruses change during replications, highly pathogenic strains can arise, resulting in severe disease and high mortality (USGS 2005). This virus appeared in wild birds, resulting in significant mortality of species such as Bar-headed Geese (*Anser indicus*), Brown-headed Gulls (*Larus ichthyaetus*), Black-headed Gulls (*L. ridibundus*), Ruddy Shelducks (*Tadrona ferruginea*), and Great Cormorants (*Phalacrocorax carbo*) in China during April 2005.

Table 1-4. Birds Killed in Nebraska by WS for FY06 AI Surveillance (MIS 2006).

SHOREBIRDS:	FY06
Killdeers	14
Sora	12
Sandpiper, Baird's	1
Sandpiper, Least	10
Sandpiper, Semipalmated	1
Snipe, Common	9
Yellowlegs, Lesser	2
Yellowlegs, Greater	1
WATERFOWL:	
Coots, American	8
Ducks, Gadwall	4
Ducks, Mallards	24
Ducks, Northern Pintail	22
Ducks, Northern Shoveler	9
Ducks, Redhead	1
Ducks, Teal, Blue-winged	123
Ducks, Teal, Green-winged	44
Ducks, Wood	8
Goose, Canada	5
OTHER:	
Egrets, Cattle	2
Grebe, Pied-billed	2
Herons, Green	1
Herons, Black-crowned Night	2
Heron, Great Blue	1
Ibis, Whiteface	2
Tern, Black	2

The occurrence of HPAI H5N1 raised concern regarding the potential impact on wild birds, domestic poultry should it be introduced into the United States. Numerous potential routes exist for introduction of the virus into the United States, including illegal movement of domestic or wild birds, contaminated products from an infected traveler or a bioterrorism event, and the migration of infected wild birds. Therefore, at the request of the Homeland Security Council's Policy Coordinating Committee for Pandemic Influenza Preparedness, USDA and USDI were asked to develop a coordinated National Strategic Plan for early detection of HPAI if it is introduced into North America by wild birds.

The Avian Influenza Working Group decided that while the immediate concern for AI was the introduction of HPAI H5N1 virus via migratory birds into Alaska and the Pacific Flyway (including Pacific Islands), an interagency National Early Detection System (NEDS) would address detection of the virus in all the North American flyways. The NEDS for Asian H5N1 detection provides an early warning for potentially catastrophic mortality in North American wild birds and poultry, and minimize the potential for human exposure. Nebraska WS assists in sampling birds in conjunction with existing studies when possible. Additional bird

captures will be initiated as necessary to provide a broad species and geographic-based surveillance effort. The number of birds killed directly for AI surveillance will be minimal, as most efforts are concentrated on sampling live birds captured for other purposes or recently killed birds taken as part of sport harvest or damage control operations.

The ability to efficiently control the spread of a highly infectious, exotic diseases such as highly pathogenic H5N1 is dependent upon the capacity to rapidly detect the pathogen if introduced. For this reason, a NEDS for HPAI H5N1 in wild migratory birds is not only prudent, but necessary.

The NEDS targets birds in North America that have the highest risk of being exposed to or infected with HPAI H5N1 because of their migratory movements. This includes birds that migrate directly between Asia or North Atlantic Nations (South America) and North America, birds that may be in contact with species from areas in Asia with reported outbreaks, or birds that are known to be reservoirs of AI. However, should HPAI H5N1 virus be detected in domestic birds in the United States, sampling of wild birds within the affected flyway may become a high priority as well. Effective implementation of this NEDS will require coordination and execution at state and regional levels to ensure an adequate level of surveillance for risk assessment.

In response to WS participating in the NEDS, bird species were collected and samples taken to survey for the presence of HPN1AI (Table 1-4).

1.5 Summary of Current and Proposed Action

The WS, USFWS, FAA, USAF, NGPC, NDA's and UNLE's current and proposed program is to continue to administer an adaptive IWDM program to alleviate bird damage to animal and human health and safety *(e.g.*, disease transmission, aircraft/bird strikes), agriculture (*e.g.,* crops and domestic animals), property (*e.g.,* structures, turf), and natural resources (*e.g.* threatened/endangered species). It is anticipated, based on historical information, that the majority of the bird damage management will be at: 1) airports to reduce potential aircraft/bird strikes to reduce human health and safety risks, 2) livestock facilities to reduce Starling feed consumption and fecal contamination and reduce potential risk of disease transmission to livestock, 3) urban and suburban areas to reduce human health and safety risks and protect property, 4) ethanol and power plants to reduce human health and safety risks from disease transmission and to protect property, and 5) aquaculture facilities to protect property and reduce fish consumption.

An IWDM program would be implemented on private and public lands of Nebraska[16] where a need exists, a request is received and funding is available. An IWDM strategy would be recommended and used, encompassing the use of practical and effective methods to prevent or reduce damage while minimizing harmful effects of damage management measures on humans, other species, and the environment. Under the proposed action, WS would provide technical assistance and operational damage management, including non-lethal and lethal management methods by applying the WS Decision Model[17] (Slate et al. 1992) to help determine the most appropriate action(s) to take. When appropriate, localized habitat modifications, harassment, repellents, and physical exclusion could be recommended and utilized to reduce bird damage. In other situations, birds could be removed as humanely as possible by utilizing shooting, registered pesticides and live capture followed by relocation[18] or euthanasia under permits

[16] This EA addresses bird damage management on a statewide basis on lands under cooperative agreement or other comparable documents because wildlife, especially birds in this case, are jointly managed by the NGPC and USFWS under statewide statutes, laws, regulations and policies. WS consults with the NGPC and USFWS to insure no adverse impacts to wildlife or other resources of the State would occur.

[17] The WS Decision Model is not a written process but rather a mental problem solving process to determine appropriate management actions to take.

[18] It is often unwise, unnecessary and biologically unsound to relocate damaging birds because they are often abundant and this would potentially

issued by the NGPC or USFWS, as appropriate. In determining the damage management strategy, preference would be given to practical and effective non-lethal methods. However, non-lethal methods may not always be applied as a first response to each damage or potential damage situation. The most appropriate response could often be a combination of non-lethal and lethal methods, or there could be instances where application of lethal methods alone would be the most appropriate strategy. Bird damage management would be conducted in the State, when requested and after consultation with the USFWS, FAA, USAF, NGPC, NDA and/or UNLE, as appropriate, on private or public property after an *Agreement for Control* or other comparable document has been completed. During FY03, 04, 05, and 06 WS provided technical assistance to individuals across the entire State of Nebraska.

1.5.1 Area of Analysis. Nebraska encompasses about 77,358 mi^2, not including those parts of the rivers and lakes located within the boundaries of the State. WS generally only conducts bird damage management on a very small portion of the State and on properties only where an *Agreement* is in place. Although the area worked by WS is relatively small in relation to the State, the projects are considered important to the requesters, traveling public and others.

1.6 Relationship of This EA to Other Management and Environmental Documents

1.6.1 WS Programmatic EIS. WS has issued a programmatic EIS which analyzed program activities (USDA 1997) and Record of Decision on the National APHIS-WS program. Pertinent information from USDA (1997) is incorporated by reference into this EA.

1.6.2 Final Environmental Impact Statement: Double-crested Cormorant Management. The USFWS has issued a Final EIS on the management of Double-crested Cormorants (http://www.fws.gov/migratorybirds/issues/cormorant/finaleis/CormorantFEIS.pdf). Pertinent and current information available in the EIS has been incorporated by reference into this EA[19].

1.6.3 Executive Order (EO) 13186 and MOU between USFWS and WS. EO 13186 directs agencies to protect migratory birds and strengthen migratory bird conservation by identifying and implementing strategies that promote conservation and minimize the take of migratory birds through enhanced collaboration between agencies and American Indian tribes. A National-level MOU between the USFWS and WS is being developed to facilitate the implementation of Executive Order 13186.

1.6.4 Invasive Species EO 13112 - Authorized by President Clinton, EO 13112 establishes guidance to agencies to prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause. The EO, in part, states that each agency whose actions may affect the status of invasive species shall, to the extent practicable and permitted by law: 1) reduce invasion of exotic species and the associated damages, 2) monitor invasive species populations, provide for restoration of native species and habitats, 3) conduct research on invasive species and develop technologies to prevent introduction, 4) provide for environmentally sound control, and 5) promote public education on invasive species.

1.6.5 Management Plan for Resident Canada Geese in Nebraska. The NGPC completed a

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cause damage in the new location or they would return to the original location. WS, however, would consider relocating birds if it is deemed biologically sound and a permit was issued by the NGPC or USFWS; the birds would generally be leg-band prior to release.

[19] This EA does not include actions that are authorized by the Public Resource Depredation Order (50 CFR 21.48) and Aquaculture Resources Depredation Order (50 CFR 21.47) because these DOs are not authorized in Nebraska. However, population dynamics information was used in the Double-crested Cormorant impact analysis (Chapter 4 of this EA) to determine any potential affects that may occur from the proposed action. This EA only analyzes Nebraska WS activities to manage Double-crested Cormorant damage at private and public aquaculture facilities.

Canada goose management plan for Nebraska in July 2006. The goals of this management plan are to state population goals, identify and establish consistent, appropriate management actions to meet population goals and alleviate or resolve nuisance geese problems, primarily those associated with resident Canada geese. The plan calls for the use of various management actions and strategies to meet population objectives, including the use of lethal and non-lethal methods to address problems. WS will work with and coordinate Canada goose management activities with the NGPC, when applicable.

1.6.6 Resident Canada Geese EIS. The USFWS issued a Record of Decision and final rule (August 10, 2006), and set forth rules which would authorize state wildlife agencies, private landowners, and airports to conduct (or allow) indirect and/or direct population control management activities for resident Canada geese. The USFWS final rule and Record of Decision allows APHIS-WS to take action under new rules for depredation and control orders when designated by authorized parties, and/or to work under USFWS issued DP and special Canada goose permits. In May 30, 2007, WS issued a ROD for implementation of the EIS.

1.6.7 MOU between WS and NGPC. NGPC and WS have an MOU and Work Plan that authorizes WS to "evaluate animal damage control methods and procedures to limit potential adverse effects" and "to minimize the detrimental impacts of wild animal species". In this MOU, WS is to "direct and supervise animal damage control programs and employees to assure application of the most effective, acceptable controls available".

1.7 Decision to Be Made

Based on agency relationships, MOUs and legislative mandates, WS is the lead agency for this EA, and therefore responsible for the scope, content and decisions made. The USFWS, FAA, USAF, NGPC, NDA and UNLE had input during preparation of the EA to ensure an interdisciplinary approach in compliance with NEPA and agency mandates, policies and regulations. As a cooperating agency, the USFWS may adopt this EA and make and document their own decision.

Based on the scope of this EA, the decisions to be made are:

- Should WS, USFWS, FAA, USAF, NGPC, NDA and UNLE conduct a coordinated bird damage management program in Nebraska to alleviate risks to human health and safety, and reduce damage to agriculture, property, and natural resources?
- What mitigation measures should be implemented by WS, USFWS, FAA, USAF, NGPC, NDA and UNLE?
- Would the proposed action have significant impacts on the quality of the human environment requiring preparation of an EIS?

1.8 Scope of This Analysis

1.8.1 Actions Analyzed. This EA evaluates bird damage management to reduce risks to human health and safety, and protect agriculture, aquaculture, property, and natural resources as coordinated with the USFWS, FAA, USAF, NGPC, NDA and/or UNLE.

1.8.2 Resources Not Currently Protected by WS Bird Damage Management. The current bird damage management program operates on a very small percentage of properties in Nebraska. This EA analyzes affects not only at the current program level, but at increased program levels should individuals or agencies request assistance. Any increase is anticipated to be small with very few additional affects.

1.8.3 Period for which this EA is Valid. If it is determined that an EIS is not needed, this EA will remain valid until Nebraska WS and other appropriate agencies determine that new needs for action, changed conditions or new alternatives having different environmental effects must be analyzed. At that time, this analysis and document would be supplemented pursuant to NEPA. Review of the EA would be conducted each year to ensure that the EA analysis is sufficient.

1.8.4 Site Specificity. This EA emphasizes major issues as they relate to specific areas whenever possible, however, many issues apply wherever bird damage, or potential bird damage occur and the resulting management actions taken. WS personnel use the WS Decision Model (Slate et al. 1992) as the *"on the ground"* site-specific procedure for each damage management action conducted by WS. The Decision Model is a thought process that guides WS though the analysis and development of the most appropriate individual strategy to reduce damages and detrimental environmental effects from damage management actions (see Chapter 3, Section 3.3.3 for a description of the Decision Model). The Decision Model (Slate et al. 1992) and WS Directive 2.105 describe the site-specific thought process that is used by WS. Decisions made using the model would be in accordance with plans, goals, and objectives of WS, USFWS, FAA, USAF, NGPC, NDA and/or UNLE and any minimization measures and standard operating procedures (SOP) described herein and adopted or established as part of the decision.

WS, USFWS, FAA, USAF, NGPC, NDA and UNLE analyzed the current program and proposed action, and the other alternatives in this EA against the issues that were raised. These issues were analyzed at levels that are *"site specifically"* appropriate for this action in Nebraska. Determining affects requires that WS look at the *context* of the issue and *intensity* of the action. The range of bird populations is seldom a few acres or farm but rather over a much larger area that includes different land ownerships and political boundaries. Damage management actions are generally conducted on a much smaller portion of the habitat occupied by the target birds. As professional wildlife biologists, WS, USFWS and NGPC analyze affects to bird populations, and that the damage situation with birds may change at any time in any location; wildlife populations are dynamic and mobile.

In summary, WS, USFWS, FAA, USAF, NGPC, NDA and UNLE have prepared an EA that provides as much information as possible to address and predict the locations of potential bird damage management actions and coordinates efforts with WS, the USFWS, FAA, USAF, NGPC, NDA and/or UNLE, as appropriate, to insure that native bird populations remain healthy and viable in the State. Thus, the EA addresses substantive environmental issues pertaining to bird damage management in Nebraska. To reduce damages, WS provides technical assistance and demonstrations to help prevent the need for operational damage management. WS and the cooperating agencies provide an analysis of affects of their actions and affect to reduce bird damage within the scope of the EA. The site-specificity problem occurs when trying to determine the exact location an animal would cause damage before the damage situation occurs. By using the Decision Model (Slate et al. 1992), WS believes it meets the intent of NEPA with regard to site-specific analysis and that this is the only practical way for WS to comply with NEPA and still be able to accomplish its mission. WS and the cooperating agencies determined that a more detailed and more site-specific level of analysis would not substantially improve the public's understanding of the proposal, the analysis, the decision-making process, and pursuing a more site-specific and more detailed analysis might even be considered inconsistent with NEPA's emphasis on reducing unnecessary paperwork (Eccleston 1995). In addition, in terms of considering cumulative impacts, one EA analyzing affects in Nebraska will provide a better analysis than multiple EA's covering smaller zones within Nebraska.

1.8.5 Public Involvement/Notification. As part of this process, and as required by the Council on Environmental Quality (CEQ) and APHIS-NEPA implementing regulations, this document and its Decision are being made available to the public through "Notices of Availability" published in local media, on the APHIS website and through direct mailings to parties that have specifically requested to be notified[20]. New issues or alternatives raised after publication of this EA will be fully considered to determine whether the EA should be revisited and, if appropriate, revised.

1.9 PREVIEW OF THE REMAINDER OF THIS EA

The remainder of this EA is composed of four Chapters and three Appendices. Chapter 2 discusses the issues, issues not analyzed in detail, and affected environment. Chapter 3 describes each alternative, alternatives not considered in detail, minimization measures and SOPs. Chapter 4 analyzes the environmental impacts associated with each alternative considered in detail. Chapter 5 is a list of preparers, consultants and reviewers. Appendix A is the literature cited, Appendix B discusses the legal authorities of Federal and State agencies in Nebraska, and Appendix C describes bird damage management methods available for use in Nebraska.

[20] It is entirely possible that an urgent need, such as threats to the traveling public could require that action be taken prior to reaching a decision. None of the planners and decision makers involved in this effort is precluded from considering comments filed in this process at any time (even after actions to deal with the threat have begun) and making appropriate adjustments to ongoing program operations.

CHAPTER 2: AFFECTED ENVIRONMENT AND ISSUES

2.1 INTRODUCTION

Chapter 2 discusses the issues, including issues that will receive detailed analysis in Chapter 4 (Environmental Consequences), and issues that will not be considered in detail, with the rationale. Pertinent portions of the affected environment will be addressed in this chapter in the discussion of issues used to develop minimization measures and SOPs. Additional affected environments will be incorporated into the discussions of the environmental impacts in Chapter 4.

2.2 AFFECTED ENVIRONMENTS

Nebraska encompasses 77,358 mi^2 and its inland lakes, covering more than 481 mi^2, make up almost 1% of the state's total surface area. Most of Nebraska's largest lakes are concentrated in the western $^2/_3$ of the state, and they include artificial bodies of water created by dams. The state's highest recorded elevation is Panorama Point, with an elevation of 5,424 feet above sea level. This site is located in the western portion of the state. The mean elevation of the sate is 2,600 feet above sea level. In 2003, the annual statewide average temperature was 49.3° F. Across the state, normal regional temperatures vary from 47.5°F in the north central area to 51.4°F in the southeast. In 2003, the total statewide average rainfall was 24.69 inches. Regional precipitation averages varied from a high of 31.03 inches in the southeast to a low of 17.18 inches in the Panhandle (Nebraska Blue Book 2004-2005, http://nebraskalegislature.gov/web/public/bluebook).

2.2.1 Airports. Collisions between aircraft and wildlife are a concern throughout the world because they threaten passenger safety (Thorpe 1996), result in lost revenue and costly repairs to aircraft (Linnel et al. 1996), and can erode public confidence in the airport transportation industry as a whole (Conover et al. 1995). Birds as a group represents the largest segment of wildlife populations that present hazards to aircraft, and therefore are considered a serious threat to human safety when found on or near airports.

2.2.2 State/Federally Owned Properties. State or Federal properties in urban and/or rural areas may be affected by birds causing damage to property, landscaping, natural resources, or threaten the health and safety of personnel working or living on the property. When bird problems arise on State or Federal properties, WS assistance to reduce damage and human health risks may be requested.

2.2.3 Urban and Suburban Areas. Public and private properties in urban/suburban areas may also be affected when birds cause damage to landscaping, natural resources, and property or affect human health and safety[21].

2.2.4 Agricultural, Aquaculture, Rural, and Forested Areas. Other areas of proposed action include farms, forested areas, aquaculture facilities, hatcheries or nurseries, and rural areas where birds are causing or potentially cause disease transmission and damage to agriculture crops, livestock and feed, property, and natural resources.

2.3 ISSUES ANALYZED IN DETAIL

[21] Permits will be issued by USFWS prior to any WS human/bird conflict reduction actions on bird species protected by the MBTA or actions would be compliant with a DO, as appropriate.

The following issues have been identified as areas of concern requiring detailed analysis in Chapter 4 of this EA:

- Cumulative Effects of WS Bird Damage Management on Target Species Populations
- Effects of WS Bird Damage Management on Non-target Species Populations, including T/E Species
- Risks Posed by WS Bird Damage Management Methods to the Public and Domestic Animals
- Efficacy of WS Bird Damage Management Methods

2.3.1 Cumulative Effects of WS Bird Damage Management on Target Species Populations. A common concern among members of the public and wildlife professionals, including WS personnel, is the effect of bird damage management on the target species population. WS' take of target species is small in comparison to the overall population of these species and many species WS conducts activities are considered "*anthropogenic abundant*" (Conover 2002). Quantitative population data is available for some species from the PIF Landbird Population Estimates Database (http://rmbo.org/pif_db/laped/PED2.aspx) and population trend data exists from the Breeding Bird Survey (BBS) data base (Sauer et al. 2008) for most species. The PIF Landbird Population Estimates Database and BBS were used in preparing this EA because they provide the best available data on migratory bird population trends and population estimates. The anticipated take of most species in a year would be less than 30 individuals. However, the take for certain species, such as Starlings and Pigeons, could be considerably more. Monitoring of WS' take will be conducted at least annually and activities for the MBTA protected species coordinated with the USFWS. A detailed analysis concerning WS' effect to target species populations is conducted in Chapter 4.

2.3.2 Effects of WS Bird Damage Management on Non-target Species Populations, Including T/E Species. WS' uses an IWDM approach to reduce effects on non-target species' populations which is described in Chapter 3. To reduce the risks of adverse effects to non-target species, WS would select methods that are as target-selective as possible or apply such methods in ways to reduce the likelihood of adversely affecting non-target species populations. Prior to the application of DRC-1339, for example, pre-baiting is required to monitor for non-target species that may consume treated bait. Per label directions, if non-target species that could consume treated bait are observed, then the use of DRC-1339 would be postponed or not applied. For trapping activities, WS would select trapping locations that are highly used by the target species and use baits that are preferred by the target species.

WS uses trained professional employees to conduct bird damage management programs in Nebraska. Employees would monitor work areas where bird damage management is scheduled to be conducted and notify the USFWS if a federally listed species was observed. There are five federally and state-listed T/E bird species in Nebraska: Eskimo Curlew (*Numenius borealis*), Piping Plover, Interior Least Tern (*Sterna antillarum*), Black-capped Vireo, and Whooping Crane (*Grus americana*). Additionally, the Mountain Plover (*Charadrius montanus*) is a state-listed threatened bird species is Nebraska. WS prepared a BA and determined the proposed bird damage management program would have *no effect* on federally and state-listed species in Nebraska.

2.3.3 Risks Posed by WS Bird Damage Management Methods to the Public and Domestic Pets. The primary pesticide used and proposed for use by Nebraska WS is DRC-1339. DRC-1339 is one of the most extensively studied chemicals and causes a quiet, uneventful, and apparently painless death (USDA 1995, 1997). DRC-1339 is regulated by the EPA through the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), by the NDA, and by WS Directives. Based on a thorough Risk Assessment, APHIS concluded that, when WS program

chemical methods are used according to label directions, they are highly selective to target individuals or populations, and such use has negligible impacts on the environment[22] (USDA 1997). In addition, the Nebraska WS program properly disposes of any excess solid or hazardous waste.

Shooting with shotguns, air rifles, and other firearms is selectively used for the target species and helps to reinforce bird scaring and harassment efforts. Firearm use is very sensitive and a public concern because of safety issues relating to the public and misuse. To ensure safe use and awareness, WS employees who use firearms to conduct official duties are required to attend an approved firearms safety and use training program within 3 months of their appointment and a refresher course every 2 years (WS Directive 2.615). WS employees, who carry firearms as a condition of employment, are also required to certify that they meet the criteria as stated in the *Lautenberg Amendment* which prohibits firearm possession by anyone who has been convicted of a misdemeanor crime of domestic violence.

In addition, WS may use several types of live traps to capture target birds. These include: clover, funnel, and common pigeon traps, decoy traps, nest box traps, mist nets, cannon and rocket nets, net gun, pole traps, and bal-chatri traps. As these traps are live or cage-type traps, animals can be released without harm and the traps pose no risks to the public or domestic pets.

2.3.4 Efficacy of WS Bird Damage Management Methods. Under the current and proposed Nebraska program, all methods are used as effectively as practically possible, in conformance with the WS Decision Model (Slate et al. 1992), WS Directives and relevant Federal and State laws and regulations. The efficacy of each method is based, in part, on the application of the method, the skill of the personnel using the method, and the guidance provided by WS Directives and policies for WS personnel.

WS personnel are trained in the effective use of each bird damage management method. All WS personnel applying pesticides are certified by NDA as restricted-use pesticide applicators. If shooting is determined to be an effective method for a specific bird damage problem, all personnel utilizing firearms receive training on the safe use of firearms (see Section 2.3.3).

WS believes that it is important to maintain the widest possible selection of damage management methods to effectively resolve bird damage problems. Some methods may be more or less effective, or applicable depending on weather conditions, time of year, biological considerations, economic considerations, legal and administrative restrictions, or other factors (see Appendix C for a more detailed discussion of methods).

2.4 ISSUES NOT CONSIDERED IN DETAIL WITH RATIONALE

2.4.1 WS' Impact on Biodiversity. No WS bird damage management in Nebraska is conducted to eradicate a native wildlife species. WS operates according to international, Federal, and State laws and regulations (and management plans thereof) enacted to ensure species viability. In addition, any reduction of a local population or group is frequently temporary because immigration from adjacent areas or reproduction replaces the animals removed. The affects of the current WS program on biodiversity are minor and not significant nationwide, statewide, or region wide (USDA 1997). WS operational programs primarily target Starlings and Feral Pigeons which are introduced exotic species that do not add to the avian biodiversity of Nebraska. Further, WS operates on an extremely small percentage of the land area of the State

[22] DRC-1339 is not proposed for use in grassland areas by Nebraska WS. DRC-1339 primarily used at feedlots and industrial sites.

and WS' take of any wildlife species analyzed in this EA is a small proportion of the total population and insignificant to the viability and health of the total population.

2.4.2 Humaneness of WS Bird Damage Management Methods. The issue of humaneness and animal welfare, as it relates to the killing or capturing of wildlife is an important but complex concept that can be interpreted in a variety of ways. Schmidt (1989) indicated that vertebrate pest damage management for societal benefits could be compatible with animal welfare concerns, if *" . . . the reduction of pain, suffering, and unnecessary death is incorporated in the decision making process."*

Suffering is described as a *" . . . highly unpleasant emotional response usually associated with pain and distress*. However, suffering *" . . . can occur without pain . . .* ,"and ". . . *pain can occur without suffering . . ."* (American Veterinary Medical Association (AVMA) 1987). Because suffering carries with it the implication of a time frame, a case could be made for ". . . *little or no suffering where death comes immediately . . ."* (California Department of Fish and Game (CDFG) 1999), such as shooting.

Defining pain as a component in humaneness of WS methods appears to be a greater challenge than that of suffering. Pain obviously occurs in animals. Altered physiology and behavior can be indicators of pain, and identifying the causes that elicit pain responses in humans would ". . . *probably be causes for pain in other animals . . . "* (AVMA 1987). However, pain experienced by individual animals probably ranges from little or no pain to significant pain (CDFG 1999).

Pain and suffering, as it relates to WS damage management methods, has both a professional and lay point of arbitration. Wildlife managers and the public would be better served to recognize the complexity of defining suffering, since *". . . neither medical or veterinary curricula explicitly address suffering or its relief"* (CDFG 1999).

Therefore, humaneness, in part, appears to be a person's perception of harm or pain inflicted on an animal, and people may perceive the humaneness of an action differently. The challenge in coping with this issue is how to achieve the least amount of human and animal suffering with the constraints imposed by current technology and funding.

WS has improved the selectivity and humanness of management techniques through research and development and research is continuing to bring new findings and products into practical use. Until new findings and products are found practical, a certain amount of animal suffering could occur when some bird damage management methods are used in situations where non-lethal damage management methods are not practical or effective.

Nebraska WS personnel are experienced and professional in their use of management methods so that they are as humane as possible under the constraints of current technology, workforce and funding**.** Mitigation measures/SOPs used to maximize humaneness are listed in Chapter 3.

2.4.3 Effects of WS Bird Damage Management Methods on Aesthetic Values. The human attraction to animals has been well documented throughout history and started when humans began domesticating animals. The American public is no exception and today a large percentage of households have pets. However, some people may consider individual wild animals and birds as "pets" or exhibit affection toward these animals, especially people who enjoy coming in contact with wildlife. Therefore, the public reaction is variable and mixed to wildlife damage management because there are numerous philosophical, aesthetic, and personal attitudes, values, and opinions about the best ways to manage conflicts/problems between humans and wildlife.

There is some concern that the proposed action or the action alternatives would result in the loss of aesthetic benefits to the public, resource owners, or neighboring residents. Wildlife generally is regarded as providing economic, recreational, and aesthetic benefits (Decker and Goff 1987, USDA 1997), and the mere knowledge that wildlife exists is a positive benefit to many people. Aesthetics is the philosophy dealing with the nature of beauty, or the appreciation of beauty. Therefore, aesthetics are truly subjective in nature, dependent on what an observer regards as beautiful (see Section 1.1).

Wildlife populations provide a range of social and economic benefits (Decker and Goff 1987). These include direct benefits related to consumptive and non-consumptive use (*i.e.*, wildlife-related recreation, observation, harvest, sale), indirect benefits derived from vicarious wildlife related experiences (*i.e.*, reading, television viewing), and the personal enjoyment of knowing wildlife exists and contributes to natural ecosystems (*i.e.,* ecological, existence, bequest values) (Bishop 1987). Direct benefits are derived from a user's personal relationship to animals and may take the form of direct consumptive use (using up the animal or intending to) or non-consumptive use (*i.e.*, viewing the animal in nature or in a zoo, photography) (Decker and Goff 1987). Indirect benefits or indirect exercised values arise without the user being in direct contact with the animal and come from experiences such as looking at photographs and films of wildlife, reading about wildlife, or benefiting from activities or contributions of animals such as their use in research (Decker and Goff 1987). Indirect benefits come in two forms: bequest and pure existence (Decker and Goff 1987). Bequest is providing for future generations and pure existence is the knowledge that the animals exist (Decker and Goff 1987).

Nebraska WS recognizes that all wildlife has aesthetic value and benefit. WS only conducts bird damage management at the request of the affected home/property owner or resource manager and management actions are carried out in a caring, humane, and professional manner.

2.4.4 Bird Damage is a Cost of Doing Business – a "Threshold of Loss" Should Be Established Before Allowing any Lethal Bird Damage Management. WS is aware of concerns that Federal bird damage management should not be allowed until economic losses become unacceptable. However, this type of policy would be inappropriate to apply to public health and safety situations. In addition, some losses can be expected and tolerated by agriculture producers and property owners, WS has the legal responsibility and direction to respond to requests for bird damage management, and it is program policy to aid each requester to minimize losses. The WS Decision Model (Slate et al. 1992) is used to determine an appropriate strategy.

Furthermore, in a ruling for *Southern Utah Wilderness Alliance, et al. vs. Hugh Thompson, Forest Supervisor for the Dixie NF, et al.,* the United States District Court of Utah denied plaintiffs' motion for preliminary injunction. In part the court found that it was only necessary to show that damage from wildlife is threatened, to establish a need for wildlife damage management (U.S. District Court of Utah 1993).

2.4.5 Bird Damage Management Should Not Occur at Taxpayers Expense, but Should Be Fee Based. Funding for WS comes from many sources besides Federal appropriations. Such non-federal sources include various state appropriations, local government funds (county or city), and private funds that are all applied toward program operations. WS was established by Congress as the program responsible for providing wildlife damage management to the people of the United States. Federal, state and local officials have decided that WS should be conducted by appropriating funds. Additionally, wildlife damage management is an appropriate sphere of activity for government programs, since wildlife is publicly owned and wildlife management is a government responsibility. A commonly voiced argument for publicly funded wildlife damage

management is that the public should bear the responsibility for damage to private property caused by public wildlife. The protection of agricultural resources, property, and public health and safety will always be conducted by someone. A Federal WS program provides a service to the agricultural producers, protects property, natural resources, and public health and safety, and conducts an environmentally, economically, and biologically sound program in the public interest.

Currently, Nebraska WS provides free technical assistance on bird damage management to citizens, private business, and government agencies. Operational damage management may be initiated when the problem cannot effectively be resolved through technical assistance, and when *Agreements for Control* or other comparable instruments provide for WS operational damage management, and when the necessary funds are made available. Thus, the primary focus of WS operational bird damage management in Nebraska is fee based.

2.4.6 Impacts of West Nile Virus (WNV) on Bird Populations. WNV is a mosquito–borne virus that emerged in recent years in temperate regions of North America, with the first appearance of the virus in North America occurring in New York City in 1999 (MMWR 2002, Rappole et al. 2000). The virus, which causes encephalitis, or inflammation of the brain, has been found in Africa, Western Asia, the Middle East, the Mediterranean region of Europe, and, now in the United States. Mosquitoes acquire WNV from birds and pass it on to other birds, animals, and people. While humans and horses may be infected by the virus, there is no documentation that infected horses can spread the virus to uninfected horses or other animals. Migrating birds appear to play a role in spreading the disease.

WNV has spread across the United States since 1999 and was reported to occur in all of the lower 48 states and the District of Columbia in 2006 (Center for Disease Control (CDC 2007) www.cdc. gov. ncidod/dvbid/westnile/birds&mammals.htm). WNV is typically transmitted between birds and mosquitoes. Mammals can become infected if bitten by an infected mosquito, but individuals in most species of mammals do not become ill from the virus. The most serious manifestation of the WNV is fatal encephalitis in humans, horses, and birds.

WNV has been detected in dead bird species of at least 284 species (CDC 2007). Although birds infected with WNV can die or become ill, most infected birds survive and may subsequently develop immunity to the virus (CDC 2003, www.cdc.gov.ncidod/dvbid/westnile/birds& mammals.htm, Cornell University 2003, http://environmentalrisk.cornell.edu/WNV/Summary2. cfm). In some bird species, particularly corvids (*e.g*., Crows, Blue Jays, Ravens, Magpies), WNV causes disease (often fatal) in a large percentage of infected birds (Audubon 2003 www.audubon.org /bird/wnv/, CDC 2003 www.cdc.gov.ncidod/dvbid/westnile/birds&mammals. htm, Cornell University 2003, http://environmentalrisk.cornell.edu/WNV/Summary2.cfm, MMWR 2002). In 2002, WNV surveillance/monitoring programs revealed that corvids accounted for 90% of the dead birds reported with crows representing the highest rate of infection (MMWR 2002). Large birds that live and die near humans (*i.e.,* Crows) have a greater likelihood of being discovered, therefore the reporting rates tend to be higher for these bird species and are a good "indicator species" for the presence of WNV in a specific area (Cornell University 2003, http://environmentalrisk.cornell.edu/WNV/ Summary2.cfm, Audubon 2003).

According to U.S. Geological Survey (USGS), National Wildlife Health Center (NWHC) (2003, www.nwhc.usgs.gov/research/westnile. html), information is not currently available to know whether or not WNV is having an impact on bird populations in North America. USGS states that it is not unusual for a new disease to cause high rates of infection or death because birds do not have the natural immunity to the infection. Furthermore, it is not known how long it will take

for specific bird population to develop sufficient immunity to the virus.

Surveys of wild birds completed have shown that some birds have already acquired antibodies to WNV (USGS-NWHC 2003, www.nwhc.usgs.gov/research/ west_nile.html). Based upon available Christmas Bird Counts and BBS results, USGS-NWHC (2003, www.nwhc.usgs.gov/ research/west _nile.html) states that there have been declines in observations of some local bird populations, however they do not know if the decline can be attributed to WNV or to some other cause. A review of available Crow trend data by Audubon (2003, www.audubon.org/ bird/wnv/) reveals that at least some local Crow populations are suffering high WNV related mortality, but Crow numbers do not appear to be declining drastically across broad geographic areas. USGS does not anticipate that the commonly seen species, such as Crows and Blue Jays, will be adversely affected by the WNV to the point that these bird species will disappear from the United States (USGS-NWHC 2003, www.nwhc.usgs.gov/research/ west_nile.html). Additionally, any bird found dead or incapacitated could be salvaged by WS personnel and deposited with USFWS, NGPC or health officials, as appropriate, for monitoring purposes.

2.4.7 Lethal Bird Damage Management is Futile because 50-65% of Blackbird and Starling Populations Die Each Year. Because natural mortality in Blackbird populations is 50-65% per year, some persons argue that this shows lethal bird damage management is futile (USDA 1997). However, the rate of natural mortality has little or no relationship to the effectiveness of bird damage management because natural mortality generally occurs randomly throughout a population and throughout the course of a year. Natural mortality is too gradual in concentrations of depredating birds to adequately reduce damage. It is apparent that the rate of mortality from bird damage management in Nebraska is well below the extent of any natural fluctuations in overall annual mortality and is, therefore, inconsequential to regional populations. The resiliency of bird populations does not mean individual bird damage management actions are not successful in reducing damage, but that periodic bird damage management actions are necessary in many damage situations.

2.4.8 Appropriateness of Preparing an EA (Instead of an EIS) For Such a Large Area. Some individuals might question whether preparing an EA for an area as large as the State of Nebraska would meet the NEPA requirements for site specificity. If in fact a determination is made through this EA that the proposed action would have a significant environmental impact, then an EIS would be prepared. In terms of considering cumulative impacts, one EA analyzing impacts for the entire state may provide a better analysis than multiple EA's covering smaller zones. In addition, Nebraska WS only conducts bird damage management in a very small area of the State where damage is occurring or likely to occur.

2.4.9 Cost Effectiveness of Bird Damage Management. Perhaps a better way to state this issue is by the question "Does the value of damage avoided equal or exceed the cost of providing bird damage management?" CEQ does not require a formal, monetized cost-benefit analysis to comply with NEPA (40 CFR 1502.23) and consideration of this issue is not essential to making a reasoned choice among the alternatives being considered. USDA (1997, Appendix L) states:

"Cost effectiveness is not, nor should it be, the primary goal of the APHIS WS program. Additional constraints, such as the environmental protection, land management goals, and others, are considered whenever a request for assistance is received. These constraints increase the cost of the program while not necessarily increasing its effectiveness, yet they are a vital part of the APHIS WS Program."

An analysis of cost-effectiveness in many bird damage management situations is exceedingly

difficult or impossible to perform because the value of benefits is not readily determined. For example, the potential benefit of eliminating feral Pigeons from nesting in industrial buildings could reduce incidences of illness among unknown numbers of building users. Since some bird-borne diseases are potentially fatal, or severely debilitating, the value of the benefit may be high. However, no studies of disease problems with and without bird damage management have been conducted, and, therefore, the number of cases *prevented* by effective bird damage management is not possible to estimate. Also, it is rarely possible to conclusively prove that birds are responsible for individual disease cases or outbreaks.

Another example is the management of some wildlife species to protect other wildlife species, such as T/E species. Civil values have been assigned for many common species of wildlife and can be used to calculate their value. In the case of T/E species, their value has been judged "*incalculable*" (*Tennessee Valley Authority vs Hill*, US Supreme Court 1978), making it more difficult to specifically quantify the economic benefit to restore or protect T/E species.

2.4.10 Bird Damage Management Should Be Conducted by Private Nuisance Wildlife Control Agents. Private nuisance wildlife control agents could be contacted to reduce bird damage for property owners or property owners could attempt to reduce their own damage problems. Some property owners would prefer to use a private nuisance wildlife control agent because the nuisance wildlife agent is located in closer proximity and thus could provide the service at less expense, they are not required to comply with NEPA, or because they prefer to use a private business rather than a government agency. However, some property owners would prefer to contract with a government agency. In particular, large industrial businesses, airport managers, and cities and towns may prefer to use WS because of security and safety issues, legal requirements to be accountable to the public through NEPA compliance and reduced administrative burden.

CHAPTER 3: ALTERNATIVES

3.1 INTRODUCTION

This Chapter consists of five parts: 1) introduction, 2) description of alternatives considered and analyzed in detail, including the No Action/Proposed Action (Alternative 1), 3) bird damage management strategies and methods available to reduce human/bird conflicts by Nebraska WS, 4) alternatives considered but not analyzed in detail with the rationale, and 5) minimization measures and SOPs for bird damage management techniques. Three alternatives were recognized, developed, analyzed in detail by WS, the USFWS, FAA, USAF, NGPC, NDA and UNLE. Four additional alternatives were considered but not analyzed in detail.

3.2 DESCRIPTION OF THE ALTERNATIVES

3.2.1 Alternative 1 – Continue the Current WS Adaptive Integrated Bird Damage Management Program (No Action/Proposed Action).

The No Action alternative is a procedural NEPA requirement (40 CFR 1502), is a viable and reasonable alternative that could be selected, and serves as a baseline for comparison with the other alternatives. The No Action alternative, as defined here, is consistent with the CEQ's (1981) definition.

The current and proposed program is an adaptive integrated Nebraska WS bird damage management program for the protection of public health and safety, agricultural and natural resources, aquaculture and property. It is anticipated, based on historical information, that the majority of Nebraska WS' bird damage management will be at: 1) airports to reduce potential aircraft/bird strikes to reduce human health and safety risks, 2) livestock facilities to reduce starling feed consumption and fecal contamination and reduce potential risk of disease transmission to livestock, 3) urban and suburban areas to reduce human health and safety risks and protect property, 4) ethanol and power plants to reduce human health and safety risks from disease transmission and to protect property, and 5) aquaculture facilities to protect property and reduce fish consumption.

A major goal of the program is to minimize bird-related losses. To meet this goal, WS would continue to respond to requests for assistance with, at a minimum, technical assistance, or where appropriate when permitted by the USFWS and NGPC and when cooperative funding is available, operational damage management whereby WS personnel conduct bird damage management actions. An IWDM approach would continue to be implemented under this alternative allowing for the use of legally available methods, either singly or in combination, to meet requester needs for reducing bird damage. Agricultural producers, airport managers, property owners and others requesting assistance would be provided information regarding the use of effective non-lethal and lethal techniques, as appropriate. Non-lethal methods include, but are not limited to environmental/habitat/behavior modification, decoy traps and other live traps, exclusionary devices, nest destruction, chemical repellents, and alpha chloralose (AC). Lethal methods considered by WS include: shooting, egg addling/destruction, snap traps, DRC-1339, and American Veterinary Medical Association approved euthanasia techniques, such as CO_2. WS may recommend hunting or DPs to resource owners when these methods are deemed applicable to certain bird damage management situations. Bird damage management would be allowed in the State, when requested, on private or public property where a need has been documented and an *Agreement for Control* or other comparable document has been completed. All management actions would comply with appropriate laws, orders, policies, and regulations.

3.2.2 Alternative 2 – Technical Assistance Only Program.

This alternative would not allow

for WS operational bird damage management in Nebraska. WS would only provide technical assistance and make recommendations when requested. Producers, property owners, agency personnel, or others could conduct bird damage management using traps**,** shooting, Avitrol[23], or any non-lethal method that is legal. Currently, DRC-1339 and AC are only available for use by WS employees. Therefore, use of these chemicals by private individuals would be illegal.

This "*technical assistance only*" alternative would place the immediate burden of operational damage management on State agencies, individuals and requesters. Individuals experiencing bird damage would, independently or with WS recommendations, carry out and fund damage management activities. Individual producers could implement bird damage management as part of the cost of doing business, or a State or other Federal agency could assume a more active role in providing operational damage management assistance.

If Alternative 2 was selected, operational bird damage management would be left to State (*i.e.*, NGPC) or other Federal agencies (*i.e.*, USFWS) and individuals. Some agencies or individuals may choose not to take action to resolve wildlife damage. Other situations may warrant the use of legally available management methods because of public demands, mandates, or individual preference. Methods and devices could be applied by people with little or no training and experience, and with no professional oversight or monitoring for effectiveness. This in turn could require more effort and cost to achieve the same level of problem resolution, and could cause harm to the environment, including a higher take of non-target animals and illegal use of pesticides could be greater than present. Additionally, any take of migratory birds, outside DOs, without the proper State and Federal permits is a violation of State and Federal law.

3.2.3 No WS Bird Damage Management Program.

This alternative would terminate the WS program for bird damage management (operational and technical assistance) on all land classes in Nebraska. However, other Federal, State and county agencies, and private individuals could conduct bird damage management but requesters of WS services would not have WS input. WS would not be available to provide technical assistance or make recommendations to livestock producers, airport and landfill managers, property owners or others requesting assistance. In some cases, damage management methods applied by non-WS personnel could be used contrary to their intended or legal use, or more than what is recommended or necessary. Proper State and Federal permits may not be acquired and birds species protected under the MBTA may be illegally taken. In addition, DRC-1339 and AC are only available for use by WS employees. Therefore, use of these chemicals by private individuals would be illegal and Avitrol could be used by any State certified restricted-use pesticide applicator.

A *"no control"* alternative was analyzed by the USFWS (USDI 1979) and was dismissed as an invalid alternative. A *"no control"* alternative was also evaluated in USDA (1997).

3.3 BIRD DAMAGE MANAGEMENT STRATEGIES AND METHODOLOGIES AVAILABLE TO WS IN NEBRASKA

The strategies and methodologies described below are common to Alternatives 1 and 2. Under Alternative 2, WS personnel would only provide technical assistance recommendations and conduct demonstrations. Alternative 3 would terminate both WS technical assistance and operational bird damage management in Nebraska. The methods used or recommended by WS would be supported by the WS

23 Avitrol could only be used by state certified pesticide applicators in Nebraska.

Decision Model (Slate et al. 1992).

3.3.1 Integrated Wildlife Damage Management. The most effective approach to alleviating wildlife damage is to integrate the use of several methods simultaneously or sequentially. The philosophy behind IWDM is to implement effective management methods in a cost-effective[24] manner while minimizing the potentially harmful effects on humans, target and non-target species, and the environment. IWDM draws from an array of options to create a combination of methods for the specific circumstances. IWDM may incorporate cultural practices (*e.g.*, animal husbandry), habitat modification (*e.g.*, exclusion), animal behavior (*e.g.*, scaring), local population reduction, or any combination of these, depending on the characteristics of the specific damage problem. In selecting management techniques for specific damage situations consideration is given to:

- Species responsible
- Magnitude of the damage
- Geographic extent of damage
- Duration and frequency of the damage
- Prevention of future damage
- Presence of non-target species

3.3.2 The IWDM Strategies That WS Employs.

3.3.2.1 Technical Assistance Recommendations. The implementation of damage management actions is the responsibility of the requester; however, WS personnel provide information, demonstrations, and advice on available and appropriate wildlife damage management methods. Technical assistance includes demonstrations on the proper use of management devices (*e.g.*, propane exploders, pyrotechnics, exclusionary devices, cage traps, etc.) and information on animal husbandry, localized habitat management, and animal behavior modification that could reduce damage. Technical assistance is generally provided following consultation or an on-site visit with the requester. Generally, several management strategies are described to the requester for short and long-term solutions to damage problems; these strategies are based on the level of risk, need, and practical application.

3.3.2.2 Operational Damage Management Assistance. This is the conduct or supervision of bird damage management by WS personnel. Operational damage management assistance is initiated when the problem cannot effectively be resolved through technical assistance, and when *Agreements for Control* or other comparable documents provide for WS operational damage management. The initial investigation defines the nature, history, and extent of the problem, species responsible for the damage, and methods that would be available to resolve the problem. Professional skills of WS personnel are often required to effectively resolve problems, especially if restricted-use pesticides are proposed, or the problem is complex requiring the direct supervision of wildlife professional. WS considers the biology and behavior of the damaging species and other factors. The recommended strategy(ies) may include any combination of preventive and corrective actions that could be implemented by the requester, WS, or other agency personnel, as appropriate. Two strategies are available: 1) preventive damage management and 2) corrective damage management.

[24] The cost of management may sometimes be secondary because of overriding environmental, legal, human health and safety, animal welfare, or other concerns.

3.3.2.2.1 Preventive Damage Management is the practice of applying wildlife damage management strategies before damage occurs, based on historical problems and professional experience and the probability of the damage recurring or an imminent threat of public health, or disease transmission. As requested and appropriate, WS personnel provide information and conduct demonstrations or take action to prevent historical losses from recurring or reduce the risk of potential losses from occurring. Examples would be applying bird-proof netting over fruit trees before the fruit becomes attractive to birds and the removal of a bird(s) from a food processing plant, restaurant, industrial plant, or a feedlot before the bird(s) has caused damage or threatened public or livestock health, or birds at airports.

3.3.2.2.2 Corrective Damage Management is applying wildlife damage management to stop or reduce current losses. As requested and appropriate, WS personnel provide information and conduct demonstrations, or with the appropriately signed *Agreement for Control* or other comparable document, take action to prevent additional losses. For example, in areas where birds are consuming livestock feed, WS may provide information to the resource owner about exclusionary methods, animal husbandry, mechanical scare devices and pyrotechnics, or conduct operational damage management to reduce losses.

3.3.2.2.3 Educational Efforts. Education is an important element of WS program activities because wildlife damage management is about finding balance and coexistence between the needs of people and needs of wildlife. This is extremely challenging as nature has no balance, but rather, is in continual flux. In addition to the routine dissemination of recommendations and information to individuals or organizations sustaining damage, lectures, instructional courses, and demonstrations are provided to producers, homeowners, State and county agents, colleges and universities, and other interested groups. WS frequently cooperates with other agencies in education and public information efforts. Additionally, technical papers are presented at professional meetings and conferences so that WS personnel, other wildlife professionals, and the public are periodically updated on recent developments in damage management technology, programs, laws and regulations, and agency policies.

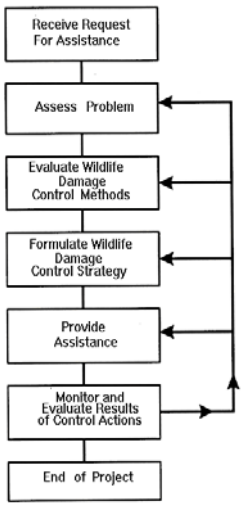
3.3.2.2.4 Research and Development. The National Wildlife Research Center (NWRC) functions as the research arm of WS by providing scientific information and development of methods for wildlife damage management that are effective and environmentally responsible. NWRC scientists work closely with wildlife managers, researchers, field specialists and others to develop and evaluate wildlife damage management techniques. NWRC research was instrumental in the development of methyl anthranilate (MA) and is currently testing new experimental drugs that inhibit bird reproduction. In addition, NWRC scientists have authored hundreds of scientific publications and reports, and are respected world-wide for their expertise in wildlife damage management.

3.3.3 WS Decision Making. The WS Decision Making[25] process is a procedure for evaluating and responding to damage complaints (Figure 3-1). WS personnel are frequently contacted only after requesters have tried non-lethal methods and found them to be inadequate for reducing damage to an acceptable level. WS personnel evaluate the appropriateness of strategies,

[25] The WS Decision Model is not a written process but a mental problem-solving process common to most, if not all professions to determine appropriate actions to take.

and methods are evaluated for their availability (*i.e.*, legal and administrative) and suitability based on biological, economic and social considerations. Following this evaluation, the methods deemed to be practical for the situation are developed into a management strategy. After the management strategy has been implemented, monitoring is conducted and evaluation continues to assess the effectiveness of the strategy. If the strategy is effective, the need for management is ended. In terms of the WS Decision Model (Slate et al. 1992), most damage management efforts consist of continuous feedback between receiving the request and monitoring the results with the damage management strategy.

Figure 3-1. WS Decision Model.



3.3.4 Management of Wildlife Hazards to Aircraft and Air Passengers. WS participates with the FAA under a MOU to provide wildlife damage management information or services, upon request, to airport managers. Sometimes WS evaluates wildlife hazards at airports and then provides Wildlife Hazard Assessments which outline the detected wildlife hazards, and assists airports in developing Wildlife Hazard Management Plans to address wildlife threats. These plans may include specific recommendations to reduce threats associated with a particular wildlife species, including birds. WS also sometimes assists airport managers in obtaining USFWS DPs for the purpose of reducing hazard threats posed by migratory birds. IWDM strategies are employed and recommended for these facilities.

In addition to operational damage management activities consisting of various harassment and lethal removal aimed at potentially injurious wildlife, WS personnel provide ongoing technical advice to airport managers about how to reduce the presence of wildlife in airport environments. WS may also participate in various habitat management projects implemented by airport personnel to provide technical expertise about specific wildlife damage management strategies and methods. In addition, WS promotes improved bird strike record keeping and maintains a program of bird identification and monitoring of bird numbers at participating airports.

WS may receive requests for assistance to resolve wildlife hazards to aircraft and the traveling public in the future from airport managers. WS may provide technical assistance and/or operational assistance using any combination of approved methods discussed in this EA which are appropriate for use in airport environments.

3.4 ALTERNATIVES CONSIDERED BUT NOT ANALYZED IN DETAIL WITH RATIONALE

Several alternatives were considered but not analyzed in detail. These are:

3.4.1 Bounties.

Bounties are payment of funds for killing birds suspected of causing losses. This alternative is not supported by wildlife and agricultural agencies such NGPC, NDA, UNLE and USFWS. WS does not have the authority to establish a bounty program and does not support this concept because:

- Bounties are generally not effective in reducing damage and it would be difficult to measure overall efficacy.
- Circumstances surrounding the bounty of birds are completely unregulated.
- There is a tendency for fraudulent claims to occur. It is difficult or impossible to prevent claims for birds taken from outside damage management areas.

3.4.2 Short Term Eradication and Long Term Population Suppression.

In Nebraska, eradication of native bird species is not a desired population management goal of wildlife management agencies including WS. Although generally difficult to achieve, eradication of a local population of Pigeons or Starlings may be the goal of individual bird damage management projects. This could, in part, be because Pigeons and Starlings are not native to North America and are only present because of human introduction. However, eradication as a general strategy for reducing bird damage would not be considered in detail because:

- WS opposes eradication of any native wildlife species.
- NGPC opposes the eradication of native Nebraska wildlife species.
- Eradication is not acceptable to most members of the public.
- Regional or statewide attempts at eradication of any native bird species would be next to impossible under the restrictions on methods and areas where bird damage management could be used in Nebraska.

Suppression would direct efforts toward managed reduction of targeted populations or groups of birds. In areas where damage could be attributed to localized populations, WS could decide to implement local population suppression, if supported by the WS Decision Model (Slate et al. 1992) and after consulting with the NGPC and/or USFWS. However, with the constraints on bird damage management methods, widespread population suppression would be difficult to maintain.

Problems with the concept of suppression are similar to those described above for eradication. It is not realistic or practical to consider large-scale population suppression as the basis of the WS program in Nebraska. Typically, WS activities in the State would be conducted on a very small portion of the sites or areas inhabited or frequented by the targeted species as discussed in Section 1.5.1.

3.4.3 Bird Damage Management Conducted Using Only Non-lethal Methods. The concept of employing a non-lethal repellent to reduce wildlife depredation arose early in agricultural history and has been pursued vigorously ever since (Rogers 1978). However, a consideration and the measure of success of a non-lethal bird damage management program depends on where target birds relocate because a new site can also be a problem. In addition, most animals adjust and ignore a new sound, a process called habituation (Bomford and O'Brien 1990). Numerous non-lethal techniques have been used to reduce damage caused by many bird species with most having limited success, were labor intensive, impractical, expensive or were not effective in reducing damage (Parkhurst et al. 1987, Dolbeer et al. 1988, Tobin et al. 1988, Bomford 1990, Bomford and O'Brien 1990, Mott and Boyd 1995, Stickley et al. 1995, Andelt and Hopper 1996, Belant et al. 1996, Belant et al. 1998). Some methods, however, had limited success, such as distress calls to repel Black-crowned Night Herons (*Nycticorax nycticorax*) and Starlings and changing management practices when the changes allow the enterprise to remain viable (Spanier 1980, Twedt and Glahn 1982, Bomford and O'Brien 1990). Important points when using frightening strategies include the timing of their application and the choice of devices employed. An aggressive and integrated frightening program is essential (Bomford and O'Brien 1990). Playing animal vocalizations to disperse birds during the night, though, can be annoying to people

trying to sleep, and could cause other disturbance to domestic animals and wildlife and people. In addition, using sounds based on animal vocalizations must have a certain degree of expertise and motivation to be successful (Bomford and O'Brien 1990).

Many aversive agents have been tested to condition birds to avoid foods, roosts and nest sites. Despite extensive research, the efficacy of these techniques remains unproven or inconsistent (Bomford and O'Brien 1990). In addition, most reported bird repellents are not currently registered by the EPA and NDA for this use and, therefore, cannot be legally used or recommended by WS for this purpose.

Limiting bird damage management to only non-lethal methods would not allow for a full range of IWDM techniques to resolve damage management problems. WS is authorized and directed by Congress to protect American agricultural and natural resources, and property. The alternatives selected for detailed analysis in this EA include non-lethal bird damage management methods and it is believed that analysis of only non-lethal methods would not allow WS the ability to address every damage situation in the most effective manner and expediency is required for public health and safety risks.

3.5 MINIMIZATION MEASURES AND STANDARD OPERATING PROCEDURES FOR BIRD DAMAGE MANAGEMENT TECHNIQUES

Minimization measures and SOPs are features of an action that serve to prevent, reduce, or compensate for unwanted affects that otherwise might result from that action. The current WS program, nationwide and in Nebraska, uses many such measures and are discussed in detail in Chapter 5 of USDA (1997). The following measures apply to the alternatives in this EA, as indicated in the columns.

Minimization Measures/SOPs	**Alternatives**		
	Current Program	Technical Assistance Only	No WS Program
Animal Welfare and Humaneness of Methods Used by WS			
Research on selectivity and humaneness of management practices would be adopted as appropriate.	X	X	
The WS Decision Model (Slate et al. 1992) would be used to identify effective biological and ecologically sound bird damage management strategies and their impacts.	X	X	
Euthanasia procedures approved by the AVMA would be used for live birds.	X		
The use of newly developed, proven non-lethal methods would be encouraged when appropriate.	X	X	
WS would continue to improve the selectivity and humaneness of management devices.	X	X	
Chemical immobilization/euthanasia procedures that do not cause pain would be used.	X		
All live traps would be maintained with food and water.	X		

Minimization Measures/SOPs	Alternatives		
	Current Program	Technical Assistance Only	No WS Program
Safety Concerns Regarding WS Damage Management Methods			
The WS Decision Model (Slate et al. 1992), designed to identify the most appropriate damage management strategies and their impacts, would be used to determine bird damage management strategies.	X	X	
All pesticides used by WS are registered with the EPA and NDA.	X		
EPA-approved label directions would be followed.	X		
Most avicides and live traps would be primarily restricted to private lands.	X		
Pesticide use would be by trained and certified personnel.	X		
WS employees, who use pesticides, participate in NDA approved continuing education to keep abreast of developments and maintain their certifications.	X		
Live traps would be placed so that captured animals would not be readily visible from any road or public area.	X		
Avicide use, storage, and disposal conform to label instructions and other applicable laws and regulations, and Executive Orders 12898 and 13045.	X		
Material Safety Data Sheets for avicides are provided to all WS personnel involved with specific bird damage management activities.	X		
Research is being conducted to: 1) improve bird damage management methods and strategies, 2) increase selectivity for target species, 3) develop effective non-lethal methods, and, 4) evaluate non-target hazards and environmental impacts.	X	X	
Concerns about Impacts of Damage Management on Target Species, T/E Species, Species of Special Concern, and Non-target Species			
WS determined there would be no effect to T/E species and would continue to adhere to all applicable measures to ensure protection of T/E species.	X		
Management actions would be directed toward localized populations or groups and/or individual offending birds.	X		
WS personnel are trained and experienced to select the most appropriate methods for removing targeted birds and excluding non-target species.	X		
WS would initiate consultation with the USFWS following any incidental take of T/E species.	X		

Minimization Measures/SOPs	Alternatives		
	Current Program	Technical Assistance Only	No WS Program
WS take of MBTA protected birds would be provided to the USFWS for monitoring the potential impacts to bird populations or trends in populations to assure the magnitude of take is maintained below the level that would cause significant adverse impacts to the viability of bird populations (See Chapter 4)	X		
WS consulted with the USFWS regarding the nationwide program and would continue to abide by all applicable measures identified by the USFWS to ensure protection of T/E species.	X	X	
The presence of non-target species are monitored before using avicides at feedlots and dairies to reduce the risk of mortality to non-target species.	X		
If non-target species are present or likely to be present at feedlots or dairies where avicides are being applied, then WS would remain on site to discourage non-target visitation.	X		

CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

4.1 INTRODUCTION

Chapter 4 provides information needed for making informed decisions and in selecting the appropriate alternative for meeting the purpose of the proposed action. This chapter analyzes the environmental consequences of each alternative in relation to the issues identified for detailed analysis in Chapter 2 and comparison with the proposed action to determine if the real or potential impacts are greater, lesser, or similar.

4.2 ENVIRONMENTAL CONSEQUENCES

The following resource values in Nebraska are not expected to be adversely affected by the alternatives analyzed: soils, geology, minerals, water quality/quantity, flood plains, wetlands, visual resources, air quality, prime and unique farmlands, aquatic resources, timber, wilderness, and range. These resources will not be analyzed further. In addition, no issues have been identified relative to bird damage management that are inconsistent with EO 12898, 13045, 13112, or 13186 (see Appendix B).

4.2.1 Social and Recreational Concerns. It is not anticipated that the proposed action would result in any adverse cumulative effects to social and recreational resources. Further discussions of WS activities on social and recreational concerns are found in Section 4.3 and USDA (1997).

4.2.2 Wastes (Hazardous and Solid). When bird damage management-treated bait cannot be used or when baits are not totally consumed, the bait is disposed according to label instructions or directions provided by the EPA and NDA. It is not anticipated that the proposed action would result in any adverse cumulative effects from solid or hazardous wastes.

4.2.3 Target and Non-target Wildlife Species. Cumulative impacts to potentially affected bird species are addressed in detail in Section 4.3.1.

4.2.4 Irreversible and Irretrievable Commitments of Resources. Other than relatively minor uses of fuels for motor vehicles and electricity for office operations, no irreversible or irretrievable commitments of resources result from the Nebraska WS program. Based on these estimates, the Nebraska WS program produces negligible impacts on the supply of fossil fuels and electrical energy.

4.2.5 Cumulative and Unavoidable Impacts. Cumulative and unavoidable impacts of each alternative to bird and non-target populations are discussed and analyzed in this chapter (Section 4.3.1 and 4.3.2) and effects from this management plan are discussed in relationship to bird species/groups. This EA recognizes that the total annual removal[26] of birds by all causes is the cumulative mortality. Cumulative impacts would be mortality caused by Nebraska WS bird damage management and other known causes of mortality (USDA 1997). It is not anticipated that the proposed action would result in any adverse cumulative effects to bird/wildlife populations, including T/E species.

Estimating wildlife densities is not precise and populations and habitats are often dynamic, therefore, professional judgment is required to account for unknowns and variables. Some of the variables include things such as the ability of habitats to support populations of animals, habitat

26 It is recognized that the other mortality of wildlife (*i.e.*, road kills, disease, natural mortality, etc.) occurs throughout Nebraska but no reliable system exists for recording this information.

variability effects on population stability, predation and recruitment. In addition, wildlife populations can change considerably from one year to the next due to factors such as drought, food shortages or disease. Therefore, adverse effects assessments are based on conservative estimates and trends to better ensure that no unwanted adverse wildlife population impacts would occur.

Analysis of Nebraska WS' bird "*take*," combined with other possible mortality, indicates that cumulative annual impacts would not be significant, and through close cooperation and consultation with the USFWS and NGPC would not be expected to adversely affect bird populations. The Nebraska WS program is not expected to have any adverse cumulative effects on non-target wildlife or their habitats, including T/E species. Furthermore, bird damage management, as implemented by WS, would not jeopardize public health and safety.

4.2.6 Evaluation of Significance

Each major issue is evaluated under each alternative and the direct, indirect and cumulative impacts were analyzed. NEPA regulations describe the elements that determine whether or not an impact is "*significant*." Significance is dependent upon the context and intensity of the action. The following factors were used to evaluate the significance of impacts in this EA that relate to context and intensity (adapted from USDA 1997) for this proposal:

4.2.6.1 Magnitude of the Impact (size, number, or relative amount of impact) (intensity). The "*Magnitude*" analysis for the alternatives analyzed in this EA follows the process described in USDA (1997: Table 4-2). Magnitude is defined in USDA (1997) as *". . . a measure of the number of animals killed in relation to their abundance."* Magnitude may be determined either quantitatively or qualitatively. Qualitative analysis is based on population trends and harvest data or trends and modeling. "*Other Harvest*" includes the known sport harvest, and other information obtained from the NGPC and USFWS. "*Total Harvest*" is the sum of the Nebraska WS kill combined with the "*Other Harvest*."

4.2.6.2 Duration and Frequency of the Action. Duration and frequency of bird damage management in Nebraska is highly variable. Abiotic and biotic factors affecting bird behavior will affect the duration and frequency of bird damage management activities conducted by WS in Nebraska. Bird damage management at airports may be long duration projects but the frequency of individual operational bird damage management projects may be highly variable depending upon spatial, temporal, and biotic factors affecting the behavior of the birds that are causing damage. For instance, the removal of several birds that continue to loaf near runways may be very infrequent if non-lethal techniques prevent additional birds from habituating to the area. Projects involving **S**tarling damage management at diaries and feedlots will generally be short in duration but may happen frequently at different sites.

4.2.6.3 Likelihood of the Impact. Bird damage management in Nebraska will have a low magnitude of impact on overall populations as compared to natural mortality factors that these populations experience. Because all wildlife populations may experience compensatory and additive mortalities year round, the effect of WS bird damage management will generally not result in adverse effects to populations.

4.2.6.4 Geographic Extent. Bird damage management could occur anywhere in Nebraska where damage management has been requested, agreements for such actions

are in place and action is warranted, as determined by implementing the WS Decision Model (Slate et al. 1992). Actions would generally be limited to areas receiving damage by birds, areas with historical bird damage, or areas where a threat of damage exists.

4.3 ISSUES ANALYZED IN DETAIL

This section analyzes the environmental consequences of the issues analyzed in detail using the current program as the baseline for comparison with the other alternatives to determine if the real or potential impacts are greater, lesser or the same (Table 4-7). Four key potential issues of this program have been identified, and each of these issues is analyzed for each alternative. The four issues are:

- Cumulative Effects of WS Bird Damage Management on Target Species Populations
- Effects of WS Bird Damage Management on Non-target Species Populations, including T/E Species
- Risks Posed by WS Bird Damage Management Methods to the Public and Domestic Pets
- Efficacy of WS Bird Damage Management Methods.

4.3.1 Cumulative Effects of WS Bird Damage Management on Target Species Populations.

Analysis of this issue is limited primarily to those species most often removed during WS bird damage management, or that could be intentionally dispersed during bird damage management activities. Generally, WS conducts damage management on species whose population densities are high (*e.g.,* overabundant or anthropogenic abundant (Conover 2002)) and/or invasive species and only after they have caused damage or an identified potential damage risk exists. The analysis for magnitude of impact on these species' populations generally follows the process described in USDA (1997 Chapter 4).

Many bird species that WS conducts activities are protected by the USFWS under the MBTA. Therefore, those species (all except Starlings, House Sparrows, and Feral Pigeons) are taken in accordance with applicable State and Federal laws and regulations authorizing take of migratory birds, and their nests and eggs, including the USFWS and the NGPC permitting processes[27]. The USFWS, as the agency with migratory bird management responsibility, could impose restrictions on depredation take as needed to assure cumulative take does not adversely affect the continued viability of specific populations. This should assure that cumulative impacts on species protected under the MBTA would have no significant adverse impact on the quality of the human environment and long-term viability of the population.

The target species were selected because Nebraska WS has received requests for assistance with these species and they could be taken or deterred to protect people from injury or damage (*e.g.,* bird damage management at airports to reduce or prevent risks to the traveling public from bird strikes to aircraft), agricultural and natural resources and property. In addition, individuals of other target species could be killed or eggs/nests posing an emergency or immediate threat to human health and safety or were the health of the bird is jeopardized could be removed by Nebraska WS. This provision is allowed under Section H of WS' MBTA DP (MB714685-0, Eppley MB834783-0, Lincoln Airport MB811063-0, Offutt MB820488-2).

27 It is entirely possible that an urgent need or emergency, such as threats to the traveling public could require that action be taken prior to reaching a decision. None of the planners and decision makers involved in this effort is precluded from considering comments filed in this process at any time (even after actions to deal with the threat have begun) and making appropriate adjustments to ongoing program operations.

4.3.1.1 Alternative 1 – Continue the Current WS Adaptive Integrated Bird Damage Management Program (No Action/Proposed Action).

Alternative 1 would continue the current Nebraska WS human/bird conflict reduction program which, based on historical information, is primarily bird management at: 1) airports to reduce potential aircraft/bird strikes to reduce human health and safety risks, 2) livestock facilities to reduce starling feed consumption and fecal contamination and reduce potential risk of disease transmission to livestock, 3) urban and suburban areas to reduce human health and safety risks and protect property, 4) ethanol and power plants to reduce human health and safety risks from disease transmission and to protect property, and 5) aquaculture facilities to protect property and reduce fish consumption.

As stated earlier, additional agreements may be signed by WS in the foreseeable future to assist landowners/managers with bird damage problems, however these additional agreements are not anticipated to significantly increase WS activities or the adverse effects to bird species populations. The majority of bird species targeted by WS is migratory and range from northern to southern latitudes during the year. This analysis focuses on Nebraska and regional population data using BBS population trend data (Sauer et al. 2008) and PIF Landbird Population Estimates Database (http://rmbo.org/pif_db/laped/PED2.aspx) (see Section 4.3.1.1.1). The BBS is a national survey that annually gathers data during the nesting season, primarily in June, regarding breeding birds. The survey consists of about 3700 routes across the U.S. and Canada. The USFWS Region 6 is used because the boundaries of these geographical units are based on ecological differences making regions more meaningful in terms of migratory birds.

Non-lethal Damage Management Activities

Preference is given to non-lethal damage management methods when considered practical and effective (WS Directive 2.101). Nebraska WS dispersed about 289,043 birds of common species (*i.e.,* various Blackbirds, American Coots, Brown-headed Cowbirds, Crows, Mourning Dove, various ducks, Cattle Egrets, Canada Geese, Snow Geese, White-front Geese, Grackle, Grebes, Franklin's Gulls, Ring-billed Gulls, Red-tailed Hawks, various other hawks, Great Blue Herons, American Kestrels, Killdeer, Mallards, Meadowlarks, Feral Pigeons, American Robin, Starlings, Barn Swallows) in FY03, in FY04, 140,433 birds of 33 species in FY05, and 105,039 birds of 34 species in FY06 using non-chemical harassment methods such as propane exploders and pyrotechnics. One advantage of dispersing birds is that relatively no cumulative impact occurs. However, there would be the possibility that the birds could return to the damage site and inflict additional damages or move to another site and continue to cause damage. Normally, large scale relocation activities are limited to waterfowl in and around urban areas. Live capture and relocation is not normally practical for smaller birds such as Starlings, Pigeons, etc. because of: 1) the number of birds WS confronts annually, 2) potential public safety and health issues (*i.e.,* capturing birds at an airport where they were involved with aircraft hazards and relocating those birds to another area where they could return to an airport and continue to be a safety hazard to aircraft), 3) competition for food resources and other limiting factors with other birds and wildlife, 4) the difficulty in finding acceptable release sites, 5) costs of relocation would increase because of the great distance it requires to relocate birds if trying to prevent them from returning to the original site, and 6) relocated birds could create the same disease transmission potential to people or livestock in the relocation area (See "Relocation" in Appendix C).

Lethal Damage Management Activities

Lethal damage management is implemented when a bird damage management problem cannot be resolved effectively through non-lethal damage management and where *Agreements for Control* or other comparable documents provide for operational damage management. Table 4-1, 4-2, 4-3, and 4-4 provides information on the number of birds Nebraska WS killed by method during in FY03, 04, 05, and 06.

Table 4-1. Birds Targeted by WS during FY03.

Species	Damage Management Method				
	Trap	Shot	DRC-1339	Other*	Relocate**/ Freed***
Blackbirds, Red-winged	2	133			
Blackbirds, Mixed-Species		14			
Cormorants, Double-crested		1			
Cowbirds, Brown-headed		64			
Crows, American		13			
Doves, Mourning		217		1	
Ducks, Mallards		49			
Ducks, Teal, Blue-winged		5			
Falcons, American Kestrels	8				20
Geese, Canada		51		23	33
Grackles, Common	1	19		3	
Gulls, Franklin's		16			
Gulls, Ring-billed		23			
Hawks, Red-tailed	5	5			47
Hawks, Sharp-shinned					2
Hawks, Swainson's					1
Hawks, other					1
Herons, Great Blue		7			
Killdeers		15		10	
Meadowlarks, Eastern	4	7			
Meadowlarks, Western		9			
Owls, Great Horned	3				12
Pheasants, Ring-necked		9			
Pigeons, Feral	402	736		15	
Robins, American				7	
Sandpipers, Upland		6			
Sparrows, House/English		1		8	
Starlings, European	21	890		168	
Swallows, Barn		7		111	
Swallows, Cliff		46			
Swallows, Tree	2	2			

*The "Other" category includes eggs removed and individuals hand-caught.
**Animal was captured by you and released live at a remote location. These animals will be counted in the Annual Tables as "take" and as "freed/released" animals.
***Animal was captured and released alive at the site of capture. These animals will be counted in the Annual Tables as "take" and as "freed/released" animals.

USFWS Depredation Permits.

DPs are necessary under the MBTA and BGEPA for activities related to migratory bird damage management. DPs are not necessary for non-lethal harassment of species protected only under MBTA, but a Section 7 consultation and permit could be required for WS to conduct damage management on migratory birds listed under the ESA. Additionally, any *"take"* of a T/E listed species (which could be protected under MBTA, BGEPA and the ESA) could require multiple permits.

The USFWS has authority for managing migratory birds and issuance of DPs (50 CFR 21.41) to persons who clearly show evidence of migratory birds causing or about to cause damage. In Nebraska, individuals may also be required to obtain a Scientific Collecting Permit from NGPC. In addition, for State listed T/E bird species, WS will consult with the NGPC Biologists for affects from WS activities to these species.

WS has the responsibility for responding to and attempting to reduce damage caused by migratory birds as specified in an MOU with the USFWS and in a cooperative agreement with the

NGPC, and when funding allows. In cases where intermittent damage is occurring and it is not feasible or practical for WS to provide operational assistance, WS could recommend to the USFWS the issuance of a DP to the resource owner (WS Directive 2.301). Table 4-5 provides information on the number of requests for assistance WS received in FY03, 04, 05 and 06 for bird damage management, the number of DPs WS recommended and forwarded to the USFWS, and Table 4-6 provides the take of birds under those permits.

WS completed a Section 7 analysis under ESA to insure no adverse effects to T/E species, and is required to obtain MBTA and ESA permits for activities which may *"take"* species protected under the respective Acts. Guidelines for issuance of permits have been developed and implemented by the USFWS. WS and the USFWS believe the analysis contained in this EA will address the environmental consequences for the USFWS to issue DPs and for WS to receive and implement depredation/scientific collection permits.

Table 4-2, Birds Targeted by WS during FY04.

Species	Damage Management Method				
	Trap	Shot	DRC-1339	Other*	Relocate**/ Freed***
Blackbirds, Red-winged	1	28			
Blackbirds, Mixed-Species	1				
Cormorants, Double-crested		6			
Cowbirds, Brown-headed	6	78			
Crows, American	1	6			
Doves, Mourning	1	105		1	
Ducks, Mallard		26			
Ducks, Teal, Blue-winged		8			
Ducks, Teal, Green-winged					1
Falcons, American Kestrels	14	5			45
Geese, Canada		20		28	10
Grackles, Common	84	6			
Gulls, Franklin's		61			
Gulls, Ring-billed		23			
Hawks, Cooper's		1			2
Hawks, Harrier, Northern		1			
Hawks, Red-tailed	2	6			79
Hawks, Sharp-shinned					2
Hawks, Swainson's		1			
Herons, Great Blue		5			
Killdeers		3			
Kingfishers		1			
Meadowlarks, Eastern	8				
Meadowlarks, Western		8			
Nighthawks		7			
Passerines (Other)	1	4			1
Pheasants, Ring-necked		2			
Pigeons, Feral	85	702		104	1
Owl, Barn					1
Owl, Great-horned					21
Robins, American	3	2		10	
Sandpipers, Upland		2			
Sparrows, House/English	57	74		8	
Starlings, European	804	623	60	71	3
Swallows, Barn		11		38	
Swallows, Cliff		50		286	
Swallows, Tree	2				3
Vultures, Turkey		9			

*The "Other" category includes eggs removed and individuals hand-caught.

**Animal was captured by you and released live at a remote location. These animals will be counted in the Annual Tables as "take" and as "freed/released" animals.

***Animal was captured and released alive at the site of capture. These animals will be counted in the Annual Tables as "take" and as "freed/released" animals.

It should be noted that Starlings, House sparrows and Pigeons are considered non-indigenous, invasive species, and because of their negative impacts and competition with native birds, are considered by many wildlife biologists and ornithologists to be an undesirable component of North American wild and native ecosystems. These three species are not protected by MBTA or state law. Any population reduction of these species in North America, even to the extent of complete eradication, could be considered beneficial to native bird species. Additionally, Blackbird and Crow populations are healthy enough, and the problems they cause great enough, that the USFWS has established a "standing depredation order" (50 CFR 21.43) for use by the public. Under the DO, no Federal permit is required by anyone to remove these birds if they *are committing or about to commit depredations upon ornamental or shade trees, agricultural crops, livestock, aquaculture, or wildlife, or when concentrated in such numbers and manner as to constitute a health hazard or other nuisance*. All of the above information indicates that populations of the above listed birds are healthy and viable.

Table 4-3. Birds Targeted by WS during FY05

Species	Damage Management Method				
	Trap	Shot	DRC-1339	Other*	Relocate**/ Freed***
Blackbirds, Red-winged		42			
Cormorants, Double-crested		48			
Cowbirds, Brown-headed		24			
Crows, American	1	2			
Doves, Mourning		150		6	
Ducks, Mallards		12			
Ducks, Teal, Blue-winged		10			
Falcons, American Kestrels	5	2			40
Finches, House					15
Geese, Canada	8	34		91	4
Grackles, Common	74	6			
Gulls, Franklin's		107			
Gulls, Ring-billed		34			
Hawks, Cooper's		1			7
Hawks, Red-tailed	4	7		3	157
Hawks, Sharp-shinned					4
Hawks, Swainson's		3			1
Herons, Great Blue		1			
Killdeers		18		2	
Meadowlarks, Eastern	6	5			
Meadowlarks, Western		13			
Owl, Great Horned					17
Owls, Short-eared	1				1
Pigeons, Feral	186	632	56	4	
Robins, American	1			11	
Sandpipers, Upland		4			
Sparrows, House/English	123	2		4	
Starlings, European	1,182	583	466	30	
Swallows, Barn		15		113	
Swallows, Cliff		22		9	
Turkeys, Wild (All)		1			
Vultures, Turkey	2	2			

*The "Other" category includes eggs removed and individuals hand-caught.
**Animal was captured by you and released live at a remote location. These animals will be counted in the Annual Tables as "take" and as "freed/released" animals.
***Animal was captured and released alive at the site of capture. These animals will be counted in the Annual Tables as "take" and as "freed/released" animals.

4.3.1.1.1 WS, at Times, Conducts Lethal Bird Damage Management on the Species Below

Many bird population trends are best monitored by using data from the BBS[28]. The BBS is a large-scale inventory of North American birds coordinated by the USGS Patuxent Wildlife Research Center (Sauer et al 2008). The BBS is a combined set of more than 3,500 roadside survey routes primarily covering the continental United States and southern Canada. The BBS was started in 1966, and routes are surveyed in June by experienced birders. The stated primary objective of the BBS has been to generate an estimate of population change for songbirds. Populations of birds tend to fluctuate, especially locally, as a result of variable annual local habitat and climatic conditions. Trends can be determined using different population equations, and statistically tested to determine if a

Table 4-4. Birds Targeted by WS during FY06

Species	Damage Management Method					
	Trap	Shot	A/C	DRC-1339	Other**	Relocate***/ Freed****
Blackbirds, Red-winged	12	16				
Cormorants, Double-crested		14				
Cowbirds, Brown-headed		10				
Crows, American		2				
Doves, Mourning		337			5	
Ducks, Mallards*		4				
Ducks, Teal, Blue-winged*		5				
Falcons, American Kestrels	20					13
Geese, Canada*	6	143	2		136	62
Grackles, Common	33	51			6	
Gulls, Franklin's		82				
Gulls, Ring-billed		9				
Hawks, Cooper's						3
Hawks, Red-tailed	1	4			1	65
Hawks, Sharp-shinned						2
Herons, Great Blue*		11				
Jays, Blue						1
Killdeers*		43				10
Meadowlarks, Eastern	2	3				
Meadowlarks, Western		15				
Pigeons, Feral	129	1,368				
Owls, Great Horned						15
Robins, American		7			16	
Sandpipers, Least*						16
Sandpipers, Solitary						4
Sandpipers, Spotted						9
Sandpipers, Upland		6				
Shorebirds, Other						43
Shrike, all						1
Snipe, Common*						1
Sparrows, House/English	79	38				
Starlings, European	1,113	3,208		589	7	19
Swallows, Barn		7			28	
Swallows, Cliff		26			15	
Vultures, Turkey		35				
Passerines (Other)		1				

*Species listed in this table were not collected for AI monitoring (please refer to Table 1-4 for species collected for AI monitoring).
**The "Other" category includes eggs and individuals hand-caught.
***Animal was captured by you and released live at a remote location. These animals will be counted in the Annual Tables as "take" and as "freed/released" animals.
****Animal was captured and released alive at the site of capture. These animals will be counted in the Annual Tables as "take" and as "freed/released" animals.

28 Although these data have been processed successfully on a computer system at the USGS, no warranty expressed or implied is made regarding the accuracy or utility of the data on any other system or for general or scientific purposes, nor shall the act of distribution constitute any such warranty.

trend is significant. The significance of a trend's "change" is reflected in the calculated *P*-value (probability) for that species.

To use the BBS, though, a few assumptions need to be accepted:

- All birds within a ¼ mile of the observer are seen at all stops on a BBS route; this assumption is faulty because observers often cannot see a ¼ mile in radius at all stops due to obstructions such as hills, trees, and brush and because some bird species are elusive. Therefore, the birds seen per route would provide a conservative estimate of the population. In Nebraska, the detectability of birds would vary based on terrain and cover.

- The chosen survey routes are totally random and are fully representative of Nebraska habitats. However, when BBS routes are established, survey rules allow the observers to make stops for surveys based on better quality habitat or convenient parking areas, even though the survey sites are supposed to be spaced a ½ mile apart. Therefore, if survey areas had stops with excellent food availability, such as a landfill site or waterfowl nesting habitat where birds may congregate, the count survey could be biased. This would tend to overestimate the population. However, if these sites were not on a route at all, the population could be underestimated.

Table 4-5. Requests for Assistance and DP Recommended by WS by FY.

FY	Resource Protected	Requests	DP Recommended
03	Agriculture	6	0
	Health & Safety	187	5
	Natural Resources	50	12
	Property	12	2
04	Agriculture	19	0
	Health & Safety	310	5
	Natural Resources	27	7
	Property	24	0
05	Agriculture	28	0
	Health & Safety	257	5
	Natural Resources	7	3
	Property	69	1
06	Agriculture	24	0
	Health & Safety	243	5
	Natural Resources	10	4
	Property	83	3

- Birds are equally distributed throughout the survey area (*i.e.,* Nebraska, Western Region or USFWS Region 6) and routes were randomly selected. However, routes are randomly picked throughout the State/areas, but are placed on the nearest available road. The starting point is picked for accessibility by vehicle. Some birds tend to congregate along roadsides and others avoid roadside areas. However, most BBS routes are selected because they are "off the beaten path" so the observer can hear birds without interruption from vehicular noise.

WS recognizes the statistical variability of the data and believes that the BBS represents the best available commercial and scientific data available to evaluate bird abundance trends. Trend data reported for all species below reflect apparent trends in reported data. WS has not independently evaluated statistical significance in trend data. Because bird damage management is generally directed at individual birds or local populations of overabundant/ anthropogenic abundant (Conover 2002) species, the statistical significance of abundance trends over a large area are only marginally related to local populations where bird damage management occurs.

Starling and Blackbird Biology and Population Impacts

Precise counts of Starling and Blackbirds do not exist, but one estimate placed the Unites States summer population at more than one billion (USDA 1997) and the winter population at 500 million birds (Royall 1977). Meanley and Royall (1976) estimated 538 million Blackbirds and Starlings in winter roosts across the country during the winter of 1974-75. Of this total about 74% or about 400 million were in the eastern United States (Meanly and Royall 1976).

Table 4-6. Birds Taken in Nebraska Under Permits Issued*, ** by the USFWS

Species	2003	2004	2005	2006
Cormorant, Double-crested	327	514	10	218
Cowbird, Brown-headed				6
Crow, American		2	2	1
Dove, Mourning	30	46	96	319
Duck, Blue-winged Teal		7	8	5
Duck, Mallard		20	5	11
Falcon, American Kestrel	8	14	9	11
Goose, Canada	7	21	36	148
Grackle, Common				155
Gull, Franklin's		64	139	73
Gull, Herring		2		
Gull, Ring-billed	23	42	35	47
Hawk, Cooper's		1		
Hawk, Red-tailed	3	10	7	4
Hawk, Swainson's		2	2	
Heron, Great-blue	63	80	26	95
Killdeer	7	2		42
Kingbird, Western		4		
Meadowlark, Eastern	5	8	3	8
Meadowlark, Western		16	10	11
Nighthawk, Common		7		
Owl, Great-horned		1		8
Pelican, American white	35	25		28
Robin, American		15		7
Sandpiper, Upland	6	2	3	6
Swallow, Barn	50	45	49	23
Swallow, Cliff		45	22	26
Vulture, Turkey		6		26

* Permits active during 2003 was 12, 9 during 2004, 12 during 2005 and 16 during 2006.

** USFWS data is summarized and reported on a calendar year.

European Starling Biology and Population Impacts

Starlings were introduced into North America in 1890-91 when about 80 pair were released into New York City's Central Park (Bump and Robbins 1966). In just 100 years, Starlings have colonized the United States and expanded into Canada and Mexico and have become one of the most common birds in North America (Feare 1984). Nationwide Starlings have been estimated at 140 million indivuduals (Johnson and Glahn 1994) and Meanly and Royall (1976) report that the 1974-75 winter Starling population in the eastern States was estimated at about 112 million birds. An extensive population survey by Dolbeer and Stehn (1983) showed that in the northwestern United States, the number of breeding Starlings tripled between 1968 and 1981. The PIF Landbird Population Estimates Database estimates that Nebraska has about 1,200,000 Starlings and about 0.1% of the estimated global population. The estimated natural mortality of Starlings is about 50%. Based on the 1974-75 wintering population estimate, about 56 million Starlings die annually in the eastern States and about 70 million Starlings die annually to natural mortality nationally (Meanly and Royall 1976).

Data from Packham (1965) suggest that an average of 57 Starlings were killed per pound of DRC-1339 treated bait used at feedlots. In addition, research studies and field observations suggest DRC-1339 treatments kill about 75% of the Starlings at cattle feeding facilities (Besser et al. 1967). Based on the amount of bait distributed by Nebraska WS, this would have resulted in a Starling take of 103,852 (FY03), 103,127 (FY04), 209,165 (FY05), and 614,888 (FY06) (MIS 2003, 2004, 2005, 2006). Through shooting, trapping, and other means, WS killed 1,079 Starlings during FY03, 1,498 in FY04, 1,795 in FY05, and 3,328 in FY06. WS used non-lethal methods to disperse a total of 565,373 Starlings during FY03 through FY06 (MIS 2003, 2004,

2005, 2006). BBS data (Sauer et al. 2008) indicate Starling breeding abundance has increased in Nebraska from 1966-2006 and relatively stable in USFWS Region 6 and deceasing in the Western BBS Region. European Starlings are a non-native species so any reduction in their abundance could be considered beneficial to native birds. This information, plus the fact that an estimated 70 million Starlings die of natural causes indicates that the impact from Nebraska WS Starling damage management is of the low magnitude.

Red-Winged Blackbird Biology and Population Impacts

Red-winged Blackbirds are one of the most widespread and numerous birds in Nebraska with flocks of up to 100,000 birds reported (Tekiela 2003). The estimated Red-winged Blackbird population in Nebraska is 5,2000,000 birds which is an estimated 2.5% of the global population (http://rmbo.org/pif_db/laped/PED3.aspx). Throughout much of North America, the Red-winged Blackbird nests in hayfields, marshes, and ditches. Red-winged Blackbirds winter in the southern United States. Insects are the dominant food during the nesting season, with the diet shifting predominantly to grain and seeds in late summer through winter. Outside nesting season, Red-winged Blackbirds congregate in large nighttime roosts of up to a several million birds in marshes or woods.

Females lay three to five eggs that hatch after 12 days and the young are ready to fledge about 10 days later; two to four young generally fledge each year to offset the high natural mortality rate of 40% to 50%. Females will often renest if their initial nest is destroyed. Red-winged blackbirds can cause considerable damage to ripening corn, sunflower, sorghum, oats and ripening rice (Dolbeer 1994). After the breeding season, the birds gather with other Blackbirds in flocks numbering up to a million creating a potential health hazard (Knopf 1977).

WS killed 135 Red-winged Blackbirds during FY03, 29 in FY04, 42 in FY05, and 28 in FY06 (MIS 2003, 2004, 2005, 2006). Additionally, 2,460 Red-winged Blackbirds were dispersed during FY03 through FY05, with none dispersed or moved during FY06. Red-winged Blackbird BBS trends show that their abundance is relatively stable in Nebraska, in USFWS Region 6, and in the Western BBS Region (Sauer et al. 2008). Based on the above information and WS limited take of Red-Winged Blackbirds in Nebraska, WS activities have a low magnitude of impact on Red-winged Blackbird abundance.

Brown-Headed Cowbird Biology and Population Impacts

The Brown-headed Cowbird male is a glossy black bird, with a chocolate brown head and a pointed, sharp gray bill. The female is a dull brown bird with bill similar to the male. The Cowbird is the only parasitic bird in Nebraska, laying all its eggs in a host bird's nests and leaving the host bird to raise the young as their own (Tekiela 2003). This species probably associates with the same host species as in Kansas where 121 have been reported (Lowther 1984, 1988). The Cowbird is common in open or patchy woodlands and usually in small flocks, often with Blackbirds (Sibley 2003).

The estimated Cowbird population in Nebraska is 2,300,000 with Nebraska having about 4% of the estimated global population (http://rmbo.org/pif_db/laped/PED3.aspx). WS killed 182 Cowbirds through trapping and shooting during FY03 through FY06 and dispersed another 10,649 to protect human health and safety at airports. Population trends for the Brown-headed Cowbird are relatively stable in Nebraska, in the USFWS Region 6 and in the Western BBS Region (Sauer et al. 2008). This level of take by WS in Nebraska would have a low magnitude of impact on Brown-headed Cowbird abundance.

Common Grackle Biology and Population Impacts

The Common Grackle male, slightly larger than the female and has more iridescence on its head and throat. The Common Grackle nests in shelterbelts, farmyards, marshes, and towns throughout North America east of the Rockies feeding in fields, lawns, woodlots, and bottomlands. These birds often flock with Red-winged Blackbirds, Cowbirds, and Starlings while wintering in the southern United States (Dolbeer 1994).

The Common Grackle's diet is somewhat similar to that of the Red-winged Blackbird, but more predatory, occasionally feeding on small fish, field mice, songbird nestlings, and eggs. Grackles have larger, strong bills allowing them to feed on acorns and other tree fruits in winter. Grackles often roost with Red-winged Blackbirds and have similar reproductive and survival rates. Grackles will feed on mature field corn in the dent stage and pull up sprouting corn (Dolbeer 1994).

The estimated Common Grackle population in Nebraska is 3,900,000 with Nebraska having about 4% of the estimated global population (http://rmbo.org/pif_db/laped/PED3.aspx). During FY03, WS killed 23 Grackles, 90 in FY04, 80 in FY05, and 90 in FY06. Another 5,943 Common Grackles were dispersed during FY03 through FY06 to reduce the risk of bird/aircraft strikes (MIS 2003, 2004, 2005, 2006). According to BBS trend data, Common Grackle abundance appears to be slightly declining in Nebraska and relatively stable in USFWS Region 6 and the Western BBS Region (Sauer et al. 2008). Because of the low number of Grackles removed by WS annually, WS activities are having a low magnitude of impact on Common Grackle abundance.

It is possible that some Blackbirds and Grackles could be present and unidentifiable in flocks of Starlings where Nebraska WS conducts bird damage management at feedlots and dairies, or at airports. Because of this possibility, Nebraska WS could potentially take up to 500 of each of these species, and remove the eggs from up to 50 Common Grackle nests as permitted by the USFWS. Based on this information, it has been determined that bird damage management would likely have minimal cumulative effects to these Blackbird abundance based on BBS trend data (Sauer et al. 2008), PIF Landbird Population Estimates Database (http://rmbo.org/pif_db/laped/PED2.aspx), their reproductive potential and natural mortality (see Section 2.4.4). Therefore, removal of damaging Blackbirds would have a low magnitude of impact on Blackbird abundance. Additionally, Blackbird populations found in Nebraska are healthy enough, and the problems they cause great enough that the USFWS has established a standing DO for use by the public. Under this "Order" (50 CFR 21.43), no Federal permit is required by anyone to remove Blackbirds if they are committing or about to commit depredations upon ornamental or shade trees, agricultural crops, livestock, or wildlife, or when concentrated in such numbers and manner as to constitute a health hazard or other nuisance. All of the above information indicates that Starlings and Blackbirds analyzed in this EA are abundant and viable in Nebraska, USFWS Region 6 and nationwide.

Wild Turkey Biology and Population Impacts

The Wild Turkey is the largest upland game bird in North America. The Merriam's Wild Turkey (*Meleagris gallopavo merriami*), found primarily in the ponderosa pine, western mountain regions of the United States, has been successfully stocked beyond its suspected natural range in the Rocky Mountains and outside of the mountains into Nebraska, Washington, California Oregon and other areas (National Wild Turkey Federation, www.nwtf.org).

The Wild Turkey was extirpated from Nebraska by about 1915 and Turkey restoration began in 1959 with the release of birds captured from other states. Four subspecies of Turkeys have been released into Nebraska's varied Turkey habitat. The birds prospered, especially in the Merriam's subspecies and hybrid birds, and the turkey's range now includes most major river drainages and the pine ridge with small, isolated populations found in appropriate habitat outside the primary range.

Turkeys are a game species in Nebraska and has a regulated hunting season with an estimated 21,957 Turkeys killed during the 2006 spring and fall Turkey hunting seasons (http://www.ngpc.state.ne.us/hunting/pdfs/springturkeyreport.pdf, K. Hams, NGPC, 2007 pers. comm.). No Wild Turkeys were killed by WS in Nebraska during FY03, FY04 and FY06: however, in FY05 one Wild Turkey was killed by shooting to protect human health and safety. WS dispersed 30 Wild Turkeys during FY05 and 7 during FY06 (MIS 2003, 2004, 2005, 2006). BBS population trend data (Sauer et al. 2008) indicates that Wild Turkey abundance is dramatically increasing in Nebraska, USFWS Region 6 and in the BBS Western Region.

The NGPC estimates the 2007 Turkey population at approximately 100,000 to 150,000 birds (K. Hams, NGPC, 2007 pers. comm.). Based on an anticipated increase in requests for services as the Turkey abundance increases, WS' lethal management of Wild Turkeys for airport safety or other resource protection could remove damaging birds without adversely affecting their abundance in Nebraska. WS activities would result in a low magnitude of impact on Nebraska's Turkey abundance, given the fact that almost 22,000 Turkeys were killed by sport hunters in Nebraska in 2006, and no impact on hunting opportunities.

Ringed-necked Pheasant Biology and Population Impacts

The Ringed-necked Pheasant is native to Asia but has been widely introduced elsewhere as a game bird. Pheasants were introduced in North America in 1857, and have become well established throughout much of the Midwest, the Plains states, and parts of the West, as well as Canada and Mexico; it is most common on the Great Plains, including Nebraska (http://www.ngpc.state.ne.us/ wildlife/guides/birds/showbird.asp?BirdID='118').

Pheasant are one of the world's most hunted birds, as it has been introduced for that purpose to many regions, and is also common on game farms where it is commercially farmed for this purpose. Pheasants can be found across the globe due to their readiness to breed in captivity and the fact they can acclimate to many climates.

The estimated Pheasant population in Nebraska is 800,000 (http://rmbo.org/pif_db/laped/PED3.aspx). Sport harvest in Nebraska during the 2006/2007 hunting season was 386, 686 birds (J. Lusk, NGPC, 2008, pers. comm.) and WS in Nebraska shot 9 Pheasants during FY03, 2 in FY04 and dispersed 6 in FY03, 3 in FY04, 1 in FY05 and 0 in FY06 at airports to protect human health and safety.

Nebraska BBS population trend data (Sauer et al. 2008) indicate that Pheasant abundance is declining slightly in Nebraska, stable in USFWS Region 6 and slightly increasing in the Western BBS Region. The impact of Nebraska WS current bird damage management program on Pheasant abundance and sport harvest opportunities is not having an adverse effect and is considered a low magnitude of impact.

Feral Pigeon Biology and Population Impacts

Feral Pigeons, also known as Rock Doves, are an introduced non-native species to North America and are not protected by law. Any lethal Nebraska WS bird damage management is restricted to sites where Pigeons are causing damage, or are considered a health threat or nuisance, and reduction or removal of a local population could be attempted. This action would be considered beneficial since it would reduce disease threats and property damage/defacing.

The estimated feral Pigeon population in Nebraska is 290,000 (http://rmbo.org/pif_db/laped/PED3.aspx). Nebraska WS used shooting and trapping to remove 1,153 Pigeons during FY03, 891 in FY04, 822 in FY05, and 1,497 in FY06 and dispersed 96 in FY03, 7 in FY04, 7 in FY05 and 15 in FY06. In FY05 and FY06, Nebraska WS used 66 and 17 grams of DRC-1339, respectively to reduce property damages and to address human health and safety concerns (MIS 2003, 2004, 2005, 2006). Based on the calculations for DRC-1339 use, WS may have killed up to 2,640 and 680 in FY05 and FY06 Pigeons, respectively with DRC-1339.

Nebraska BBS population trend data (Sauer et al. 2008) indicate that feral Pigeon abundance is decreasing slightly in Nebraska and slightly increasing in USFWS Region 6 and the Western BBS Region. The impact of Nebraska WS current bird damage management program is not having an adverse effect on Pigeon abundance in Nebraska, in USFWS Region 6 or in the Western BBS Region. However, WS could take several thousand Pigeons annually to protect the public from disease threats or aircraft/bird strikes (*i.e.,* human health and safety) and property from defacing without adversely affecting the species. Because Pigeon are not protected under MBTA and are an invasive species, WS or any other sources of mortality could be considered beneficial to native species and had a low magnitude of impact.

Mallard Biology and Population Impacts

The Mallard is the world's most familiar duck (Gooders and Boyer 1986) and is the most adaptable, occupying a wide range of habitats. Clutch sizes vary from 10-12 eggs and incubation takes about 28 days. One of the Mallard's foraging characteristics is its ability to utilize agricultural grain crops as well as natural aquatic foods (Johnsgard 1975).

Duck production depends upon water conditions and when water is abundant, production is good and poor production is expected when water is scarce. Other factors that may influence Mallard population trends are predation and limited nesting habitat (Garrettson and Rohwer 1994, Garrettson et al. 1995).. In Nebraska, the Mallard is an abundant regular spring and fall migrant across the entire state and a common regular breeder statewide (http://www.ngpc.state.ne.us/wildlife/guides/birds/showbird.asp?BirdID='52'). During the 2005 regulated waterfowl hunting season, sport hunters killed an estimated 89,415 Mallards in Nebraska (http://www.fws.gov/migratorybirds/reports/HIP/CFHIPdatabook2006.pdf). The BBS population trend data from 1966 to 2006 indicates that Mallards have slightly declining in Nebraska, but increasing in USFWS Region 6 and the Western BBS Region (Sauer et al. 2008).

Non-lethal methods were used to move or disperse 3380, 1402, 258, and 367 Mallards in FY03, FY04, FY05, and FY06. WS removed 49 (FY03), 26 (FY04), 12 (FY05), and 28 (FY06) Mallards by shooting to protect human health and safety at airport facilities and for AI surveillance in the State (MIS 2003, 2004, 2005, 2006).

Based on an anticipated increase in requests for services, WS' lethal removal of up to 230 Mallards, both wild and domesticated, annually for airport safety and protection of other resources would not adversely affect Mallard abundance. Because Mallard abundance appears to be increasing in USFWS Region 6, sport hunters killed 89,415 Mallards in Nebraska in 2005 and

because of USFWS DP requirements, WS actions would result in a low magnitude of impact and have low impacts to hunting opportunities.

Great Blue Heron Biology and Population Impacts.

One of the tallest birds in Nebraska, the Great-blue Heron stands about 38 inches tall and has a wing span of about 70 inches (Robbins et al. 1997). Great-blue Herons are the most widely distributed heron in the United States and are commonly seen in Nebraska during the spring, summer, and autumn. Herons feed on fish and other aquatic vertebrates and are commonly viewed standing or wading on the shores of ponds, creeks, and rivers. The head of the Heron is largely white with dark under parts and the body is primarily bluish in color.

During FY 03 Nebraska WS shot 7 Great-blue Herons, 5 in FY 04, 1 in FY 05 and 11 in FY06 to reduce risks to aircraft damage at airports, to protect fish at aquaculture facilities and for AI monitoring (MIS 2003, 2004, 2005, 2006). BBS population trend data for Nebraska indicate that Great-blue Herons are increasing and relatively stable in USFWS Region 6 and the BBS Western Region (Sauer et al. 2008). Because Great-blue Heron abundance appears to be stable to increasing in Nebraska, in the USFWS Region 6 and in the BBS Western Region and with USFWS oversight provided, WS could take up to 30 Great-blue Herons to protect human health and safety at airports or remove birds to monitor for AI without adversely affecting abundance. This level of take by WS in Nebraska would have a low magnitude of impact.

Upland Sandpiper Biology and Population Impacts

The Upland Sandpiper is the "shorebird of the prairie". While most of its relatives are never found far from water, this species has made itself at home on the grasslands. Of the 47 species of shorebirds known to nest in North America, only the Killdeer, Mountain Plover (*Charadrius montanus*) and Long billed Curlew (*Numenius americanus*) have a similar strategy of nesting and feeding in upland prairie habitat.

Formerly, the summer range of the Upland Sandpiper extended from Maine to Kansas and then northwest to Alaska. Recently it has suffered declines in the eastern part of its range but it is holding steady in the Great Plains. Fragmentation of habitat is responsible for the declines. The Upland Sandpiper prefers grasslands of 40 acres or more and these have been disappearing rapidly in the northeastern U.S. due to old fields changing back to forest and suburbanization of the countryside.

The young are long-legged like their parents and can follow them around within two days after hatching. Only one nest is made each season and there are 4 eggs per clutch. The young are fledged by the time they are a month old. The birds begin their trek back to South America soon afterwards, and practically all of them have left on their southward migration by the end of August as they are a long distance migrant.

Non-lethal methods were used to move or disperse 50 Upland Sandpipers in FY03, 13 in FY04, and 14 in FY05, and Nebraska WS shot 6 Upland Sandpipers in FY03, 2 in FY04, 4 in FY05, and 6 in FY06 to protect human health and safety at airports (MIS 2003, 2004, 2005, 2006).

Based on an anticipated increase in requests for services, WS' lethal removal of up to 20 Upland Sandpipers in any one year for airport safety and for the protection of other resources would not adversely affect their abundance. Upland Sandpiper abundance appears to be decreasing in Nebraska, increasing in USFWS Region 6 and stable the BBS Western Region, and because of

USFWS DP requirements, WS actions would result in a low magnitude of impact.

Mourning Dove Biology and Population Impacts

Mourning Doves are migratory bird with substantial populations throughout much of North America and are the most common native Dove found in suburban and farmland areas and is the most widely hunted and harvested game bird. This Dove, found across the United States and southern Canada, is most common throughout the Great Plains in the Midwest. They can be found on telephone wires and trees in most neighborhoods in Nebraska between late March and late September or early October. They are capable of multiple brooding and their range is expanding northward (Ehrlich et al. 1988). After its prolonged breeding season, most congregate in large flocks particularly around agricultural fields (Walsh et al. 1999). They are seed eating birds and many states have regulated annual hunting seasons for this species, including Nebraska, and take is liberal.

Nebraska WS used non-lethal methods to disperse 3,494 Mourning Doves in FY 03, 1,457 in FY 04, 2,144 in FY 05 and 625 in FY 06 at airport facilities to prevent possible aircraft/bird strikes. WS also lethally removed 217 during FY03, 106 in FY 04, 150 in FY 05 and 337 in FY06 to reduce property damage and protect health and human safety (*i.e*., aircraft/bird strikes) and the USFWS reported that 491 Mourning Doves were killed under DP's (Table 4-6) (MIS 2003, 2004, 2005, 2006). The estimated Mourning Dove population in Nebraska is 6,200,000 with Nebraska having about 4.6% of the estimated global population (http://rmbo.org/pif_db/laped/PED3.aspx). Mourning Doves are a game species with a regulated hunting season with preliminary estimates of 365,900 Mourning Doves harvested during the 2004 hunting season and 371,100 harvested in 2005 in Nebraska (http://www.fws.gov/migratorybirds/reports/status06/Mourning %20Dove%20 Population%20Status,%202006%20report.pdf).

Mourning Dove abundance trends appear to have decreased slightly to stable in Nebraska and in USFWS Region 6 and slightly declining in the Western BBS Region according to the BBS (Sauer et al. 2008). Based on the number of Mourning Doves lethally removed in the past and anticipated work in the future, WS' lethal management of Mourning Dove in Nebraska could remove up to 1,000 damaging or potentially damaging birds and eggs from 50 active nests in any one year as permitted by the USFWS without adversely affecting mourning dove abundance. WS activities would result in a low magnitude of impact and have low impacts to hunting opportunities to hunters that harvested 737,000 Morning Doves during the 2004 and 2005 season.

American Robin Biology and Population Impacts

The American Robin is a familiar bird with a rusty red breast, nearly black head and tail, and a white eye ring. The female is similar to male with a gray head and duller breast. The Robin feeds on insects, fruit, berries, and worms and commonly seen in lawns cocking its head to the side while searching for food (Tekiela. 2003). During the nonbreeding season they often gather in large flocks and form huge communal roosts. Robins' breed from Alaska east to Newfoundland, south to California, east to Texas, and South Carolina. It is now common near human habitation largely because urban and suburban yards and parks provide habitat. It breeds statewide but is most numerous in eastern Nebraska (Sharpe et al. 2001). The estimated American Robin population in Nebraska is 3,600,000 with Nebraska having about 1.1% of the estimated global population (http://rmbo.org/pif_db/laped/PED3.aspx).

During FY03 through FY06, Nebraska WS removed 7 Robins in FY03, 5 in FY04, 5 in FY05, and 9 in FY06 and disperse another 160 Robins using non-lethal techniques to protect human

health and safety and prevent aircraft/bird strikes at airport facilities (MIS 2003, 2004, 2005, 2006). The BBS trend data indicates that breeding Robin populations are slightly increasing in Nebraska and stable in USFWS Region 6 and the Western BBS Region (Sauer et al. 2008). Under a DP issued by the USFWS, WS may remove up to 50 Robins and eggs from 50 active nests annually and this effect on American Robin abundance would result in a low magnitude of impact.

Killdeer Biology and Population Impacts

Killdeer occur over much of North America from the Gulf of Alaska coastline the range extends southward throughout the United States and reaches the Atlantic and Pacific coasts (Hayman et. al. 1986). Killdeer are technically in the family of shorebirds, they are unusual shorebirds in that they often nest and live far from water. Killdeer are commonly found in a variety of open areas, even concrete or asphalt parking lots at shopping malls, as well as fields and beaches, ponds, lakes, road-side ditches, mudflats, airports, pastures, and gravel roads and levees but are seldom seen in large flocks. Killdeer appear in Nebraska in February or early March and breeds throughout Nebraska (Sharpe et al. 2001). It's also one of the last migrants to leave in the fall, remaining into December (Sharpe et al. 2001).

Distinguishing characteristics include a dark, double banded breast, with the top band completely encircling the upper body. Another band is located at the head, resembling a mask absent of the facial portion. The band is continuous, thinning while going across the face along the forehead region and above the bill, and thickening at the supercilium; extending around the eye and onward around the back of the head. Plumage is relatively absent of complexity with the exception of a vividly colored, reddish-orange rump that is visible during flight and behavioral displays. The rest the body consists of a grayish-brown coloration along the dorsal side, crown and nape, while the ventral region is white. Sex characteristics are difficult to determine since killdeer are essentially monomorphic. The clutch of up to four eggs is laid in a ground scrape in open habitats (Leck 1984).

WS activities with Killdeer occur primarily on airports to reduce bird/aircraft strike hazards. WS killed 25 killdeer in FY03, 3 in FY04, 20 in FY05, and 57 in FY06 at airports to reduce the risks and to protect human health and safety and AI surveillance (Tables 4-1, 4-2, 4-3, 4-4) (MIS 2003, 2004, 2005, 2006). At airports, WS also used non-lethal methods to disperse 161 killdeer during FY03 to FY 06. BBS trend data indicate that killdeer abundance in Nebraska is slightly increasing, and slightly decreasing in USFWS Region 6 and decreasing in the Western BBS Region (Sauer et al. 2008). Based on an anticipated increase in requests for services, WS' removal of up to 215 damaging or potentially damaging Killdeer in Nebraska and eggs from 10 nests in any one year, as permitted by the USFWS, could occur without adversely affecting Killdeer abundance. Based on the above information, USFWS oversight and WS limited take of Killdeer in Nebraska, WS would have a low magnitude of impact on this species.

Meadowlark Biology and Population Information

Meadowlarks are common, short-tailed, long-billed birds of meadows and fields and both species have a black "V" on a yellow breast. It is commonly seen from roadsides where it sings from posts and fences. Meadowlark flight consists of series of rapid, stiff wingbeats broken by brief glides with wings held rigidly downward. Eastern and Western Meadowlarks have different calls and songs. Visually, the species are differentiated by cheek plumage being white in Eastern and yellow in Western.

Eastern meadowlarks breed from British Columbia east to western New York and south to

California, Great Lakes region, and central Texas with northern birds moving south in winter. WS killed 11 in FY03, 8 in FY04, 11 in FY05, and 5 in FY06 to protect property and human health and safety (MIS 2003, 2004, 2005, 2006). In FY03, non-lethal methods were used by WS to move or disperse 12 meadowlarks at airport facilities to prevent aircraft/bird strikes.

The estimated Eastern Meadowlark population in Nebraska is 50,000 birds with Nebraska having about 0.5% of the estimated global population (http://rmbo.org/pif_db/laped/PED3.aspx). BBS trends indicate the Eastern Meadowlark breeding abundance has decreased in Nebraska, in USFWS Region 6 and in the Western BBS Region (Sauer et al. 2008). To protect human health and safety, only a small number of birds were lethally removed and as a result, under a DP issued by the USFWS, WS may remove up to 130 damaging or potentially damaging Eastern Meadowlarks to reduce the risk of aircraft-bird strikes and this effect on Eastern Meadowlarks would result in a low magnitude of impact.

Western meadowlarks breed from Minnesota east to central Maine and south to Arizona and Florida with northern birds moving south to winter. During FY03, FY04, FY05, and FY06, WS killed 9, 8, 13, and 15 Western Meadowlarks, respectively at airport facilities to protect human health and safety and dispersed another 40 Meadowlarks during that time to prevent aircraft-bird strikes (MIS 2003, 2004, 2005, 2006).

The estimated Western Meadowlark population in Nebraska is 2,7600,000 with Nebraska having about 8.4% of the estimated global population (http://rmbo.org/pif_db/laped/PED3.aspx). The BBS trends (Sauer et al. 2008) indicate that breeding Western Meadowlark abundance is slightly decreasing in Nebraska, in USFWS Region 6 and the Western BBS Region. Under a DP permit issued by the USFWS, WS could remove 125 Western Meadowlarks in any one year without adversely affecting Western Meadowlark abundance and resulting in a low magnitude of impact.

American Crow Biology and Population Impacts

American Crows are distributed north to south from the Yukon Territory, Canada, to Baja, California and Gulf of Mexico, and are found from the west coast to the east coast (Johnston 1961). Crows use a variety of natural and human-altered habitats including rangelands, riparian woodlands (Knopf and Knopf 1983, Richards 1971), croplands, wetlands, fields, roadsides, pastures (Sullivan and Dinsmore 1992), beaches, shores of streams and lakes (Good 1952, Chamberlain-Auger et al. 1990), urban/suburban areas, and golf courses (Chamberlain-Auger et al. 1990, Caffrey 1992). In general, Crows thrive in areas of mixed habitat (open areas interspersed with woods), and thus have responded well to human-altered habitats (Marzluff et al. 2001). American Crows can be found throughout the year in Nebraska. From their spring nesting colonies, or autumn and winter roosts, they forage for insects, grain, and carrion. Their diet includes insects, earthworms, small vertebrates (frogs, fish, baby mice), road-kills, a variety of agricultural grains and crops (corn, wheat, barely, rye, etc.), small fruits (almonds, pecans, cherries), wild fruits (blackberries, sumac, etc.) and human refuse. In urban areas, Crows often feed at concentrated food sites (landfills) during the day and roost in nearby wooded areas at night. Johnston (1961) reports that Crows reach their peak abundance in agricultural areas where there are wooded areas, and have increased in numbers where agricultural practices have increased. Crow territories tend to be smaller in urban than in rural areas (Dickinson 1998) and are highly variable in size. Territory sizes range from 0.04 km^2 in suburban New York (Dickinson 1998) to 2.6 km^2 (SD=1.4, n=10) in a waterfowl breeding area of Manitoba (Sullivan and Dinsmore 1992); Nebraska encompasses about 77,358 mi^2. Caffrey (1992) reported an extremely high breeding density of 0.8 pairs/ha on a golf course in Encino, California. Emlen (1942) also documented high densities (111 nests in 44 ha) of nesting Crows in a walnut orchard in California. Nesting occurs most often in eastern Nebraska and least common in the southern

panhandle. Nests are placed high in trees in many habitats with agriculture areas most preferred. In the past 25 years Crows have become common urban dwellers nesting in neighborhoods with mature trees (Sharpe et al. 2001). Nesting success in Crows was as low as 39% in Saskatchewan (Ignatiuk et al. 1991), and up to 43% in California (Caffrey 2000). Crows are most common in winter in Nebraska when resident populations are augmented, presumably by birds from farther north. During late fall and winter large flocks form and often roost in cities and towns throughout the State.

The estimated American Crow population in Nebraska is 280,000 with Nebraska having about 0.9% of the estimated global population (http://rmbo.org/pif_db/laped/PED3.aspx). According to the BBS trend results, Crow abundance in Nebraska, in the USFWS Region 6 and in the Western BBS Region is relatively stable (Sauer et al. 2008). In addition, Crows are abundant enough, and the problems they cause great enough, that the USFWS has established a standing DO for use by the public. Under this "order" (50 CFR 21.43), no Federal permit is required by anyone to remove crows if they are *committing or about to commit depredations upon ornamental or shade trees, agricultural crops, livestock, or wildlife, or when concentrated in such numbers and manner as to constitute a health hazard or other nuisance*.

WS used lethal and non-lethal bird damage management to reduce damage caused by Crows. During FY03 through FY06, WS dispersed 2,187 Crows in FY03, 29 in FY04, 140 in FY05 and 43 in FY06, and killed 13 in FY03, 7 in FY04, 3 in FY05, and 2 in FY06 at airport facilities to protect property, human health and safety and reduce aircraft-bird strikes. In addition, in FY03, FY04, FY05 and FY06, Nebraska WS used 0, 14, 2 and 2 grams of DRC-1339, respectively to reduce property damages and to address human health and safety concerns (MIS 2003, 2004, 2005, 2006). Based on the calculations for DRC-1339 use, WS may have killed up to 700 Crows in FY04, 100 in FY05 and 100 in FY06 with DRC-1339. If damage occurs or if Crows present a threat at airport facilities to the traveling public or aircraft from aircraft-bird strikes, WS could disperse up to 3,000 Crows or remove up to 1,000 Crows under USFWS permits annually with a low magnitude of impact on Crow abundance. Additionally, WS can remove eggs from 10 active Crow nests as permitted by the USFWS with minimal effect.

Turkey Vulture Biology and Population Impacts

This species breeds from Canada to southern South America, adapting equally well to deserts, eastern deciduous forests, and tropical lowlands (Wilbur 1983). Adult Turkey Vultures are black in color with a bright-red, naked head (Robbins et al. 1997), while immature Vultures have black heads. Turkey Vultures migrate to Nebraska during March and early April, nest, and return to their winter range in fall with few remaining in Nebraska after October (Sharpe et al. 2001). Turkey Vultures nest in caves, hollow trees, thickets, or old buildings (Jackson 1983, Ritter 1983). Usually two eggs are laid during nesting but as many as four eggs have been documented (Jackson 1983).

Turkey Vultures are carrion feeders, eating fresh meat or carrion in advanced stages of decay, and will readily feed on mammal and bird carcasses of various sizes. In search of food, Vultures soar in circle-type patterns. When food is located by a single bird, other birds are quickly attracted to the site by behavior cues exhibited by the feeding bird.

Local vulture abundance has been known to increase and decline (Wilbur 1983) which suggests that food availability could be a limiting factor. A major range expansion into the northeastern United States began after 1920, possibly caused by a decline in bison (*Bison bison*) carrion in the west and an increase of white-tailed deer (*Odocoileus virginianus*) populations and other road-killed animals.

The estimated Turkey Vulture population in Nebraska is 6,000 with Nebraska having about 0.1% of the estimated global population (http://rmbo.org/pif_db/laped/PED3.aspx). The BBS trend data indicates Turkey Vulture breeding abundance has increased in Nebraska and also increasing in USFWS Region 6 and the Western BBS Region (Sauer et al. 2008).

During FY03 through FY06, WS killed 7 Turkey Vultures in FY04, 4 Vultures in FY05, and 31 Vultures in FY06 to protect property and human health and safety. WS used non-lethal methods to disperse 399 Turkey Vultures, mostly off of roosts, from FY03 through FY06 (MIS 2003, 2004, 2005, 2006). Since Turkey Vulture abundance appears to be increasing in Nebraska, in the USFWS Region 6 and the Western BBS Region, WS could take up to 120 Turkey Vultures annually under a DP issued by the USFWS to protect human health and safety and property without adversely affecting this species. Based upon the low level of anticipated take and the increasing Turkey Vulture abundance, WS activities would have a low magnitude of impact.

Raptors

Raptors are a large, worldwide family of diurnal birds of prey (*i.e.,* flesh eaters) equipped with strong, curved talons for capturing and killing live prey and heavy, sharp, hooked bills to cut and tear flesh for consumption. In most species the sexes appear alike; however the males are smaller than the females. In addition, there is much individual variation in coloration, and several species have dark forms.

Red-tailed Hawk Biology and Population Impacts

Red-tailed Hawks are a well-known and common *Buteo*. They range throughout North America to central Alaska and northern Canada, and south as far as Panama. Although not truly migratory, they do adjust seasonally to areas with abundant prey. In winter many of the northern birds move south. They nest in woodlands and feed on rodents and rabbits in open country. The uniformly colored tails of the adult and dark belly band are the best field marks; however, they show a great deal of individual variation in plumage. They often perch on poles or treetops to hunt. The Red-tailed Hawk is the largest hawk, usually weighing between 2 and 4 pounds. As with most raptors, the female is nearly $^{1}/_{3}$ larger than the male and may have a wing span of 56 inches. In Nebraska it is a common spring and fall migrant, they are a fairly common breeder statewide, and common regular winter visitor in the southern part of the State (Sharpe et al. 2001)

The estimated Red-tailed Hawk population in Nebraska is 34,000 with Nebraska having about 1.5% of the estimated global population (http://rmbo.org/pif_db/laped/PED3.aspx). BBS trends indicate that Red-tailed Hawk abundance has steadily increased in Nebraska, in USFWS Region 6 and the Western BBS region (Sauer et al. 2008). During FY03 through 06, WS dispersed 1,955 Red-tailed Hawks and in FY03, 04, 05 and 06, WS killed 10, 8, 14 and 6, respectively to reduce the risk of aircraft-bird strikes at airports (MIS 2003, 2004, 2005, 2006). Non-lethal methods were used by WS to relocate 47 Red-tailed Hawks in FY03, 79 in FY04, 157 in FY05, and 65 in FY06 (MIS 2003, 2004, 2005, 2006). Because Red-tailed Hawk abundance has increased in Nebraska and USFWS Region 6 and the Western BBS Region, removal of up to 75 Red-tailed Hawks causing damage or potentially causing damage (*i.e.,* aircraft-bird strikes) annually under a DP issued by the USFWS would result in a low magnitude of impact on this species. This DP also allows for the removal of eggs from 12 active Red-tailed Hawks nests.

Swainson's Hawk Biology and Population Impacts

This hawk can be found in open grasslands, prairies, farmlands, and deserts that have some trees

for nesting. They summer in the western half of North America and can winter in eastern Argentina, Paraguay, and southern Brazil. They mainly hunt mice, ground squirrels, rabbits, birds, and reptiles during the breeding season, and largely live off insects like grasshoppers, locust, and beetles during the non-breeding season and usually hunt by swooping down from a perch or while walking along the ground, and may hunt in teams. Their breeding habitat is prairie and dry grasslands in western North America. They build a stick nest in a tree, shrub or on a cliff edge and lined with greenery, and is usually placed low in a tree, bush, or shrub. The female lays 2 - 3 eggs that are incubated for 34 - 35 days. The young fledge about 6 weeks later and become sexually mature at 2 years.

The estimated Swainson's Hawk population in Nebraska is 11,000 with Nebraska having about 2.3% of the estimated global population (http://rmbo.org/pif_db/laped/PED3.aspx). BBS trend data indicates that Swainson's Hawk abundance is slightly decreasing in Nebraska, and relatively stable in USFWS Region 6 and the BBS Western Region (Sauer et al. 2008). During FY04 1 Swainson's Hawk was killed by WS and 3 in FY 05. Non-lethal methods were used to move or disperse 46 Swainson's Hawks in FY03, 82 Hawks in FY04, 25 Hawks in FY05, and 8 Hawks in FY06 to protect property, human health and safety and prevent aircraft/bird strikes (MIS 2003, 2004, 2005, 2006). In FY05, one Swainson's Hawk was relocated from an airfield by WS. Because WS' activities with Swainson's Hawk are conducted under a DP issued by the USFWS after their biological reviews, would result in a low magnitude of impact to this species.

Northern Harrier Biology and Population Impact

Northern Harriers reside in North America, Europe, and Asia, and prefer open country, like grasslands, steppes, wetlands, meadows, cultivated areas, and tundra and birds in the northern part of the range migrate south. They eat small mammals, birds, reptiles, insects, and carrion by hunting low and in slow flight over the ground, and then plunge onto their prey.

Northern Harriers nest on the ground in thick grass, shrubbery, or other vegetation in a nest that is a pile of sticks and grass. The female lays 3 - 6 eggs depending on the abundance of small rodents with the eggs incubated for 29 - 31 days, and the young hawks fledge 4 - 5½ weeks later. Harriers mature in 2 - 3 years, but may be able to breed their first year.

The estimated Northern Harrier population in Nebraska is 4,000 with Nebraska having about 0.3% of the estimated global population (http://rmbo.org/pif_db/laped/PED3.aspx). BBS trends indicate that Northern Harrier abundance is relatively stable in Nebraska, USFWS Region 6 and the BBS Western Region (Sauer et al. 2008). During FY03 through 06, WS killed one Northern Harrier in FY04 to protect human health and safety *(i.e.*, reduce risks of an aircraft-bird strike). Non-lethal methods were used to move or disperse 53 Northern Harriers in FY03, 34 in FY04, 4 in FY05, and 3 in FY06 to protect property, human health and safety and prevent aircraft-bird strikes (MIS 2003, 2004, 2005, 2006). Because Northern Harrier abundance appears to be relativity stable, removal of up to 25 Northern Harriers causing damage or potentially causing damage annually (*i.e.*, aircraft-bird strikes) under a DP issued by the USFWS would result in a low magnitude of impact to this species.

Cooper's Hawk Biology and Population Impacts

The Cooper's Hawk is a strictly North American species and one of the three *Accipiter* Hawks. The Cooper's Hawk is a woodland species and as a forest hawk, it has adapted remarkably well to life in and around the older suburbs, especially in areas where small woodlots stand. In size, it falls between the larger Northern Goshawk (*Accipiter gentiles*) and the smaller Sharp-shined Hawk. Males are about Crow size and females larger. Although it occasionally captures small

rodents, it has evolved to prey upon smaller birds; it is more of a specialist in the pursuit of medium-sized birds, like Mourning Doves, American Robins and other similarly sized birds.

Cooper's Hawks are closely associated with deciduous and mixed forests and open woodland habitats. Nesting often occurs in man-made open clearings. Wintering habitats are similar to nesting habitats and birds are less prone to migrate then Sharp-shined Hawks. Home range of these hawks is relatively large. Stick nests are placed in trees with overhead cover with clutch size from three to six eggs. In Nebraska, Cooper's Hawks are a rare, regular breeder statewide and a rare regular winter visitor statewide (Sharpe et al. 2001).

The estimated Cooper's Hawk population in Nebraska is 900 individuals with Nebraska having about 0.2% of the estimated global population (http://rmbo.org/pif_db/laped/PED3.aspx). BBS trends indicate that Cooper's Hawks are increasing in USFWS Region 6 (Sauer et al. 2008). During FY03 through 06, WS killed 1 Cooper's Hawk by shooting in FY04 and 1 in FY05 at airport facilities to protect human health and safety *(i.e*., reduce risks of an aircraft-bird strike). Non-lethal methods were used to disperse 2 Cooper's Hawks in FY03, 1 in FY04, 13 in FY05, and 3 in FY06 to protect property, human health and safety and prevent aircraft-bird strikes. WS relocated 2, 7, and 3 Cooper's Hawks in FY04, 05, and 06, respectively. WS, however, received 6 requests for assistance in FY03, 17 in FY04, 5 in FY05 and 3 in FY06 to protect human health and safety (*i.e.,* aviation) (MIS 2003, 2004, 2005, 2006). Because Cooper's Hawk abundance appears to be increasing in USFWS Region 6, removal of up to 38 Cooper's Hawks causing damage or potentially causing damage annually (*i.e*., aircraft-bird strikes) under a DP issued by the USFWS would result in a low magnitude of impact to this species.

American Kestrel Biology and Population Impacts

American Kestrels are the smallest and most common falcon in open and semi-open country, which frequently use telephone poles or wires as hunting perches and are often mistaken for a songbird. Estimates of up to 1.2 million breeding pairs have been made for the North American population (Cade et al. 1988), with an equal number thought to breed in the neotropics. Their breeding range extends as far north as central and western Alaska across northern Canada to Nova Scotia, and extends south throughout North America, into central Mexico, the Baja, and the Caribbean. They are local breeders in Central America and are widely distributed throughout South America. Most of the birds breeding in Canada and the northern United States migrate south in the winter, although some males stay as year round residents.

Kestrels consume primarily insects in the summer; however, they will also eat small rodents and birds. Wintering birds feed primarily on rodents and birds. A problem with kestrels may be a scarcity of nest sites. Being a secondary cavity nester, the Kestrel requires an abandoned woodpecker hole or similar cavity to nest and must often compete with Starlings, an aggressive, invasive, secondary cavity nester. In Nebraska, Kestrels are a common migrant, a fairly common breeder statewide and an uncommon regular winter visitor (Sharpe et al. 2001)

The estimated American Kestrel population in Nebraska is 100,000 with Nebraska having about 1.8% of the estimated global population (http://rmbo.org/pif_db/laped/PED3.aspx). BBS trends indicate that American Kestrel abundance is increasing in Nebraska and relatively stable in USFWS Region 6 and slightly declining in the Western BBS Region (Sauer et al. 2008). WS killed 8 Kestrels during FY03, 19 in FY04, 7 in FY05, and 20 in FY06 and another 307 kestrels were dispersed from FY03 through FY06 to protect human health and safety, property, and prevent aircraft-bird strikes (MIS 2003, 2004, 2005, 2006). Additionally, WS relocated another 20, 45, 40, and 13 kestrals in FY03, FY04, FY05, and FY06 at airport facilities to protect human health and safety (MIS 2003, 2004, 2005, 2006). Because Kestrel populations appear healthy,

abundance is increasing in Nebraska and relatively stable in USFWS Region 6, removal of up to 110 Kestrels causing damage or potentially causing damage annually (*i.e.,* aircraft-bird strikes) under a DP issued by the USFWS would result in a low magnitude of impact to this species. Additionally, the DP allows for the removal of eggs from 10 active Kestrels nests.

Short-eared Owl Biology and Population Impacts

The Short-eared Owl is a medium-sized owl that is generally not diurnal, but most active at dusk and at night. Short-eared Owls inhabit wide open spaces such as grasslands, prairie, agricultural fields, salt marshes, estuaries, mountain meadows, and alpine and they occur widely in the Old World, in Iceland, the Hawaiian Islands, Galapagos Islands, and North and South America. They are found throughout the year in open, grass-dominated habitats in Nebraska. The sandhills' prairie and other natural grasslands are the favored habitats in Nebraska (http://www.ngpc.state.ne.us/wildlife/guides/birds/showbird.asp?BirdID='237'). They are also attracted to the wide open fields of airports and many can be killed by collisions with aircraft. Breeding habitat must have sufficient ground cover to conceal nests and nearby sources of small mammals for food. Communal roosts occur in old growth fields, along thick hedgerows, in overgrown rubble in abandoned fields, or in clumps of dense conifers. When hunting, they fly over open areas, a few feet above ground, and pounce when prey is located and in dense vegetation they hover over prey before pouncing and eat mainly small mammals. Short-eared Owls and Northern Harriers often harass each other when hunting the same field, and harriers often steal food from the owl.

Courtship and territorial behavior is spectacular for an Owl, however, this Owl has relatively small nesting territories and home ranges, varying from 35 to 500 acres, and may nest in loose colonies in excellent habitat. Nests are usually situated in the shelter of a grass mound, under a grass tuft, or among herbaceous ground cover. Clutch sizes range from 4 to 14 eggs (average 5 to 7), with large clutches laid during years of high food abundance. Eggs are laid every 1 to 2 days and incubation, done by the female, commences with the first egg and the male bringing food to the nest and occasionally taking a turn incubating. Young grow very rapidly after hatching, and begin to wander from the nest as soon as 12 days. Young fledge at about 4 weeks.

Short-eared Owls have reached almost 13 years of age. Natural enemies include many diurnal raptors such as the Bald Eagle, Northern Goshawk, Gyrfalcon (*Falco rusticolus*), Red-tailed Hawk, and Snowy Owl (*Bubo scandiacus*). Because they nest on the ground, they are vulnerable to mammalian predators, while Gulls, Ravens, and Crows steal eggs and small chicks. Collisions with vehicles account for a large number of deaths.

The estimated Short-eared Owl population in Nebraska is 1,600 with Nebraska having about 0.1% of the estimated global population (http://rmbo.org/pif_db/laped/PED3.aspx). According to the BBS, Short-eared Owls are slightly declining in the USFWS Region 6 and the BBS Western Region (Sauer et al. 2008).

WS conducted non-lethal management during FY05 to relocate 1 Short-eared Owls for health and human safety on a Nebraska airport. Based on the number of Short-eared Owls lethally removed in the past and anticipated work in the future, WS' lethal management of Short-eared Owls in Nebraska could remove 2 damaging or potentially damaging bird in any one year under permit from the USFWS without adversely affecting abundance and is of low magnitude of impact.

Great-horned Owl Biology and Population Impacts

The Great-horned Owl is common in Nebraska and throughout the United States and the largest owl in North America. The Great-horned Owl's color pattern is similar to Long-eared Owls (*Asio*

otus), however, Great-horned Owl "*ear tufts*" are larger and farther apart; their bellies are finely barred horizontally. They are found in woods, mountain forests, desert canyons, marshes, city parks, and urban forests. The Owls prefer open areas to dense woodlands or nest sites close to the edge of a forest where they can hunt. Great-horned Owls commonly occupy the abandoned nests of large birds, nests in tree cavities, stumps, in caves or on rocky ledges.

Great-horned Owls are one of the earliest nesting birds in Nebraska, laying two eggs in January and February. The female incubates eggs for 26-30 days and the young fledge in 30-35 days (Tekiela. 2003). Great-horned Owls are a common regular resident statewide and can be found statewide (Sharpe et al. 2001). They can live more than 12 years and some captive birds have lived to 29 years old.

During FY03 through FY06, WS killed 3 Great-horned Owls in FY03. WS used non-lethal methods to relocate 11 Owls in FY03, 21 in FY04, 17 in FY05, and 15 in FY06 and dispersed 3 in FY04 and 2 in FY05 at airports for the protection of property, human health and safety, and reduce aircraft-bird strikes (MIS 2003, 2004, 2005, 2006).

The estimated Great-horned Owl population in Nebraska is 54,000 with Nebraska having about 1.0% of the estimated global population (http://rmbo.org/pif_db/laped/PED3.aspx). BBS trends for Nebraska, USFWS Region 6 and in the Western BBS Region indicate that Great-horned Owl abundance is relatively stable (Sauer et al. 2008). Because Great-horned Owl abundance is relatively stable in Nebraska, USFWS Region 6 and the Western BBS Region and appear healthy, removal of up to 67 Great-horned Owls causing damage by WS annually under a DP issued by the USFWS would result in a low magnitude of impact to this species.

Common Nighthawk Biology and Population Impacts

Common Nighthawks are common spring and fall migrants in Nebraska, there have been three subspecies recorded in the state as summer residents (http://www.ngpc.state.ne.us/wildlife/guides/birds/showbird.asp?BirdID='241'). Nighhawks breed throughout the state but are most abundant in larger cities, where they nest on flat gravel roofs (Sharpe et al 2001). Both male and female are similar in the fact that both are a camouflaged brown and white with a white chin, the male carries a white band across its wings and tail that is only seen during flight, the female lacks these white bands (Tekiela 2003).

The estimated Common Nighthawk population in Nebraska is 220,000 with Nebraska having about 2.0% of the estimated global population (http://rmbo.org/pif_db/laped/PED3.aspx). According to the BBS Common Nighthawks are slightly declining in Nebraska in the BBS Western Region and stable in UFWS Region 6 during the same time period (Sauer et al. 2008).

WS conducted non-lethal management during FY04 to disperse 18 Common Nighthawks. WS removed 7 Common Nighthawks in FY 04 for health and human safety on Nebraska airports (MIS 2004). Based on the number of Common Nighthawks lethally removed in the past and anticipated work in the future, WS' lethal management of Common Nighthawks in Nebraska could remove up to 10 damaging or potentially damaging birds in any one year under permit from the USFWS without adversely affecting abundance and is of a low magnitude of impact.

Gulls

During most of the last several decades, several gull species (*i.e.*, Ring-billed and Herring Gulls) have expanded their range and increased their abundance. According to Solman (1994), Gulls can threaten human safety at airports, and are involved in more collisions with aircraft than any

other bird group because they are numerous and widely distributed. In Nebraska during the spring and fall migrations, Gulls are common at airports after a rainfall, feeding on earthworms along the wet runways, posing a risk to airport safety.

Ring-billed Gull Biology and Population Impacts

Ring-billed Gulls appearance is similar to California and Herring Gulls but they are smaller, have yellow feet, and a yellow bill with a black band near the tip. Ring-billed Gulls are a common spring and fall migrant across the State and an occasional summer resident (http://www.ngpc.state.ne.us/wildlife/guides/birds/showbird.asp?BirdID='194'). Like most Gulls, Ring-billed Gulls are omnivorous, feeding on animal and plant matter. Common feeding sites are open refuse dumps, livestock feedlots, fish hatcheries, agricultural fields, parking lots and food processing plants. Spring arrival of migrants in Nebraska begins in February with the largest numbers arriving in March, and autumn migration normally peaks in November (Sharpe et al. 2001).

WS responded to 12 requests for assistance in FY03, 11 in FY04, 6 in FY05 and 6 in FY06 to reduce Ring-billed Gull damage. In addition, the USFWS reported that 23, 42, 35 and 47 Ring-billed Gulls were killed under DP in 2003, 2004, 2005 and 2006, respectively (Table 4-6). WS removed 23 Ringed-bill Gulls in FY03, 23 in FY04, 34 in FY05, and 9 Gulls in FY06 by shooting to protect property and human health and safety at airports (Table 4-1, 4-2, 4-3, 4-4). Large numbers of Ring-billed Gulls are dispersed each year at airport facilities by WS; 3,265 Gulls were dispersed in FY03, 1,189 in FY04, 3,072 in FY05, and 932 dispersed in FY06 (MIS 2003, 2004, 2005, 2006).

BBS trend data indicate that Ring-billed Gulls in the USFWS Region 6 have increased and in the Western BBS Region they are relatively stable (Sauer et al. 2008). Because Ring-billed Gull abundance appears to be increasing and requests for assistance are increasing, WS could remove up to 480 damaging or potentially damaging Gulls without adversely affecting abundance. Based on the above information, USFWS oversight, this level of take by WS in Nebraska would have a low magnitude of impact on Ring-billed Gull abundance.

Franklin's Gull Biology and Population Impacts

The Franklin's Gull is commonly seen in Nebraska during spring and fall migration when they gather in the thousands on bodies of water, but do not nest here (Tekiela 2003). Male and female are both gray and white with a black head and black extending partially down the neck, black tip of wing separated by white band, large white eye-ring, and reddish bill (Tekiela 2003). Franklin's Gulls are similar in appearance to the Laughing Gull (*Larus atricilla*) with smaller size, shorter broader wings, and shorter bill (Sibley 2003).

WS responded to 7 requests for assistance in FY03, 5 in FY04, 7 in FY05 and 5 in FY06 to reduce Franklin's Gull damage. In addition, the USFWS reported that 23, 108, 174, and 120 Gulls of all species were killed under DP in 2003, 2004, 2005 and 2006, respectively (Table 4-6). During FY03, WS killed 16 Franklin's Gulls, 61 in FY04, 107 in FY05, and 82 in FY06 to protect resources and human health and safety at airports (Table 4-1, 4-2, 4-3, 4-4). In addition to those killed, WS used non-lethal methods to disperse and move 12,932 Gulls from FY03 through FY06 at airport facilities to minimize aircraft-bird strikes (MIS 2003, 2004, 2005, 2006).

Franklin's Gull BBS trend data for the USFW Region 6 indicate that Franklin's Gull populations have been decreasing and increasing in the BBS Western Region (Sauer et al. 2008). However, because Franklin's Gulls could occur on airport facilities and cause risk to the traveling public

and aircraft from bird strikes, WS could remove up to 750 damaging or potentially damaging Franklin's Gulls without adversely affecting their abundance. Based on the above information, USFWS oversight, this level of take by WS in Nebraska would have a low magnitude of impact on Franklin's Gull abundance.

Blue-winged Teal Biology and Population Impacts

Blue-winged Teal are small shy ducks of ponds, marshes and protected bays (Robbins et al. 1997). They breed from southeastern Alaska and western Canada to Canadian Maritimes and south to northeastern California, New Mexico, and New York. They winter from southern California, southern Texas, and Carolinas southward through tropical America. They arrive latest of all ducks at their breeding grounds and leave early in the fall. On low, marshy prairies in the central part of the continent, where Blue-winged Teal are most numerous, virtually every pond and pothole has a breeding pair. The male commonly "*stands guard*" on the pond while the female is incubating eggs. They are usually one of the first birds to migrate with many states opening an early hunting season for this duck. It is one of the faster flying ducks and since they are so small they appear to fly even faster. Both sexes have a light blue area on the forward edge of the wing, and a green speculum. During periods which males have breeding plumage they have a distinct white facial crescent.

During the 2005 regulated waterfowl hunting season, sport hunters killed an estimated 19,330 Blue-winged Teal in Nebraska and 235,715 in the Central Flyway (http://www.fws.gov/migratorybirds/reports/HIP/CFHIPdatabook2006.pdf). The BBS trend data shows that breeding abundance of Blue-winged Teal have decreased in Nebraska, stable in USFWS Region 6 and relatively stable in the BBS Western Region (Sauer et al. 2008).

WS conducted non-lethal management during FY03 through 06 to move or disperse 542, 406, 275, and 160 Blue-winged Teal, respectively, at airports. WS removed 5 Blue-winged Teal in FY03, 8 in FY04, 10 in FY05, and 128[29] in FY06 to reduce the risk of aircraft-bird strikes to protect human health and safety and AI surveillance (MIS 2003, 2004, 2005, 2006). Based on the number of Blue-winged Teal lethally removed in the past and anticipated work in the future, WS' lethal management of Blue-winged Teal in Nebraska could remove up to 85 damaging or potentially damaging birds in any one year without adversely affecting abundance. Because 19,330 birds were sport harvested in 2005 in Nebraska and 235,715 were harvested in the Central Flyway, WS activities would result in a low magnitude of impact on abundance and have low impacts to hunting opportunities for this species

Double-crested Cormorant Biology and Population Impacts

The Double-crested Cormorant is one of six species of cormorants breeding in North America and has the widest range (Hatch 1995). They range throughout North America, from the Atlantic coast to the Pacific coast. They are also a long-lived bird. From 1990 to 1997, the overall growth rate in the Interior region was estimated at 6% (Tyson et al. 1999). In Nebraska, Cormorants are abundant and regular spring and fall migrant statewide. They are also a common and regular breeder in the northern and western parts of the State (Sharpe et al. 2001).

Data from the BBS indicate that the Double-crested Cormorant abundance in Nebraska, the USFWS Region 6 and in the Western BBS Region has steadily increased[30] (Sauer et al. 2008).

[29] Many of these birds were collected for AI monitoring (see Table 1-4).

[30] The USFWS published in the Federal Register on October 8, 2003 their final rule and notice of record of decision adopting a Public Resource Depredation Order (50 CFR 21.48) based upon analysis of this alternative and other alternatives in their final EIS addressing cormorant

Nebraska WS removed 1 Cormorant in FY03, 6 in FY04, 48 in FY05 and 14 in FY06 to reduce the risk of an aircraft-bird strike and to protect aquaculture resources. Non-lethal methods were used in FY03 through FY06 to move or disperse 813 Cormorants from areas experiencing damage (MIS 2003, 2004, 2005, 2006). Based upon the above information, Nebraska WS anticipates that requests for assistance in the future to reduce Cormorant damage could result in the removal of up to 655 Cormorants annually which would be insignificant to the overall viability and reproductive success of this species and a low magnitude of impact.

House Sparrow Biology and Population Impacts

House Sparrows or English Sparrows were introduced to North America from England in 1850 and have spread throughout the continent (Fitzwater 1994). The species is not protected by Federal or State laws. Like Starlings and feral Pigeons, because of their negative impacts and competition with native bird species, House Sparrows are considered by many wildlife biologists, ornithologists and naturalists to be an undesirable component of North American native ecosystems. House Sparrows are found in nearly every habitat except dense forest, alpine, and desert environments. It prefers human-altered habitats, and is abundant on farms, in cities and suburbs (Robbins et al. 1997). In Nebraska, House Sparrows are an abundant regular resident statewide found in and around both urban and rural human habitations (Sharpe et al. 2001).

During FY03, WS killed 1 House Sparrow, 131 in FY04, 125 in FY05 and 117 in FY06 and dispersed a total of 778 Sparrows using non-lethal means from FY03 through FY06 (MIS 2003, 2004, 2005, 2006). Because they are not afforded protection by the MBTA, DP's are not required before they can be killed by the public. The estimated House Sparrow population in Nebraska is 3,000,000 with Nebraska having about 0.1% of the estimated global population (http://rmbo.org/pif_db/ laped/PED3.aspx). BBS trends show that House Sparrows are and have been decreasing in Nebraska, in USFWS Region 6, and slightly decreasing in the Western BBS Region (Sauer et al. 2008).

Any bird damage management involving lethal damage management by WS would probably be restricted to individual sites. Any reduction in House Sparrow abundance, even to the extent of complete eradication at these sites, could be considered beneficial on populations of native bird species since House Sparrows are considered an invasive species.

Canada Goose Biology and Population Impact

The Canada Goose is the most familiar Goose in North America easily recognized at a distance by the musical honking calls given by V-shaped flocks. A large gray Goose with black head and neck complete with a white chin/cheek strap. In Nebraska, Canada Geese are an abundant in spring and fall migrant and a common resident statewide. They are common in winter and are found on nearly every body of water in the State, particularly during migration and in summer months (Sharpe et al. 2001). In recent years, Canada Geese have become a common sight at golf courses, parks and retention ponds in urban areas with populations continually on the rise, damaging property and threatening human health and safety.

During FY03 through FY06, WS killed 51, 20, 77 and 239 Canada Geese, respectively. WS dispersed 43,695 Geese and relocated 93 during FY03 through FY06 to protect property, human health and safety, and prevent aircraft-bird strikes. WS also responded to 11 requests for

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management in the United States. The Public Resource Depredation Order allows people to take cormorants when they are in the act or about to commit depredations to fish, wildlife, plants, and their habitats.

assistance with Canada Goose complaints in FY03, 11 in FY04, 19 in FY05 and 26 in FY06 (Table 4-5) (MIS 2003, 2004, 2005, 2006).

BBS trend data indicate that Canada Goose abundance is stable in Nebraska and increasing in USFWS Region 6 and the Western BBS Region (Sauer et al. 2008). Because of USFWS oversight and population levels, the potential take of 750 Canada Geese and eggs from 221 active nests as permitted by the USFWS by WS to protect property, human health and safety, aquaculture, and reduce bird strikes in Nebraska would have a low magnitude of impact on Canada Goose abundance.

Barn Swallow Biology and Population Impact

Barn Swallows are common near farms, bridges and other buildings, where they build mud nests on building rafters, bridges, or other vertical structures. Sexes appear similar with blue-black back, cinnamon belly, reddish-brown chin and forehead and long forked tail (Tekiela 2003). The Barn Swallow is the only Swallow in Nebraska with a forked tail (Tekiela 2003). According to migration records, the Barn Swallow is the most common Swallow in Nebraska (http://www.ngpc.state.ne.us/wildlife/guides/birds/birdname.asp).

WS responded to 10 requests for assistance with Barn Swallow in FY03, 10 in FY04, 13 in FY05 and 10 in FY06. During FY03, WS kill 17 Barn Swallows, 15 in FY04, 25 in FY05 and 16 in FY06 and dispersed 3,393 Swallows over the 4-years to protect property, human health and safety and prevent aircraft-bird strikes (MIS 2003, 2004, 2005, 2006). The estimated Barn Swallow population in Nebraska is 1,600,000 with Nebraska having about 0.8% of the estimated global population (http://rmbo.org/pif_db/laped/PED3.aspx). BBS data indicate that Barn Swallow trends are relatively stable in Nebraska and USFWS Region 6, and slightly declining in the Western BBS Region (Sauer et al. 2008). WS' take of up to 750 Barn Swallows to protect property and human health and safety will have a low magnitude of impact to this species, and take will only occur under a DP issued by the USFWS. The DP also allows for the removal of 50 Barn Swallow eggs and any additional eggs from 260 active nests.

Cliff Swallow Biology and Population Impact

Cliff Swallows are also common in Nebraska during the summer commonly nesting in colonies around bridges (especially bridges over water) and rural housing. These Swallows are uniquely patterned with a dark back, wings, and cap and distinctive tan-to-rust rump, cheek, and forehead (Tekiela 2003). In Nebraska Cliff Swallows are an abundant and regular spring and fall migrant and are a breeder statewide but more common in western Nebraska (Sharpe et al. 2001).

WS responded to 2 requests for assistance with Cliff Swallow complaints in FY03, 14 in FY04, 6 in FY05 and 4 in FY06. During FY03, WS kill 46 in FY03 Cliff Swallows, 50 in FY04, 22 in FY05 and 26 in FY06 and dispersed 3,773 Swallows during FY03 through FY06 to protect human health and safety and prevent aircraft-bird strikes (MIS 2003, 2004, 2005, 2006). The estimated Cliff Swallow population in Nebraska is 3,600,000 with Nebraska having about 2.6% of the estimated global population (http://rmbo.org/pif_db/laped/PED3.aspx). BBS data indicate that Cliff Swallow abundance trends are increasing in Nebraska, in USFWS Region 6 and the Western BBS Region (Sauer et al. 2008). Since Swallow trends appear to be increasing in Nebraska, in USFWS Region 6 and the Western BBS Region, WS could remove under a DP issued by the USFWS up to 450 damaging or potentially damaging Cliff Swallows annually without adversely affecting abundance. Additionally, WS can remove 200 Cliff Swallow eggs and any additional eggs from 950 active nests. These activities will have a low magnitude of impact on Cliff Swallow abundance.

Tree Swallow Biology and Population Impact

Tree Swallows are blue-green in the spring and greener in the fall with a white belly, notched tail, and pointed wing tips. Commonly found along ponds, lakes, and agricultural fields and often seen flying back and forth across open fields, feeding on insects (Tekiela 2003). They nest in tree hollows and nest boxes, migrating in huge flocks, going north earlier in the spring and lingering farther north in the fall then other Swallows (http://www.ngpc.state.ne.us/wildlife/guides/birds/birdname.asp). In Nebraska, Tree Swallows are a common and regular spring and fall migrant statewide, and a common breeder in eastern Nebraska (Sharpe et al. 2001). The estimated Tree Swallow population in Nebraska is 20,000 with Nebraska having about 0.1% of the estimated global population (http://rmbo.org/pif_db/laped/PED3.aspx).

WS did not disperse any Tree Swallows during FY03 through FY06, however, did kill 4 Tree Swallows in FY03, and 2 in FY04 at airport facilities to protect human health and safety and prevent aircraft-bird strikes (MIS 2003, 2004, 2005, 2006). Tree Swallow breeding abundance is increasing in Nebraska, in USFWS Region 6 and the Western BBS Region (Sauer et al. 2008). Based on requests for service, WS could remove 25 damaging or potentially damaging birds annually without adversely affecting abundance and this activity would be considered a low magnitude of impact on Tree Swallows.

4.3.1.1.2 The Species Below were Primarily Collected as Part of a Nationwide Effort to Monitoring and Detect the Presence of Avian Influenza, or Potentially Other Wildlife Diseases.

Northern Pintail Biology and Population Impacts

The Pintail is a widely occurring duck which breeds in the northern areas of Europe, Asia and North America and a common, locally abundant, regular spring and fall migrant, and common summer resident across the entire state of Nebraska (http://www.ngpc.state.ne.us/wildlife/guides/birds/showbird.asp?BirdID='62'). It is a bird of open wetlands which nests on the ground, often some distance from water. It feeds by dabbling for plant food and adds small invertebrates to its diet during the nesting season. This duck's population is affected by predators, parasites and avian diseases. Human activities, such as agriculture, hunting and fishing have also had an impact on numbers. Nevertheless, this species' huge range and large population mean that it is not threatened. During the 2004 and 2005 regulated waterfowl hunting season, sport hunters killed an estimated 3,030 and 3,052 Pintails, respectively, in Nebraska (http://www.fws.gov/migratorybirds/reports/HIP/CFHIPdatabook2006.pdf). The BBS population trend data indicate that Pintails have decreased in Nebraska and in the BBS Western Region, but have increased in USFWS Region 6 (Sauer et al. 2008).

WS removed 22 Pintails in FY06 for AI surveillance in the State. Based on an anticipated increase in requests for services, WS' lethal removal of up to 10 Pintails annually for airport safety and protection of other resources would not adversely affect Pintail abundance. Because Pintail abundance appears to be increasing in the BBS Western Region, sport hunters killed 3,030 and 3,052 Pintails in Nebraska in 2004 and 2005 and because of USFWS DP requirements, WS actions would result in a low magnitude of impact and have low impacts to hunting opportunities.

Northern Shoveler Biology and Population Impacts

The Northern Shoveler is a common and widespread duck which breeds in the northern areas of Europe and Asia and across most of North America. This duck is unmistakable in the Northern

Hemisphere due to its large spatulate bill. This is a bird of open wetlands, such as wet grassland or marshes with some emergent vegetation, and feeds by dabbling for plant food, often by swinging its bill from side to side and using the bill to strain food from the water. It also eats mollusks and insects in the nesting season. The nest is a shallow depression on the ground, lined with plant material and down, usually close to water. It is common and locally abundant in Nebraska and a spring migrant statewide. It is also a locally common and regular breeder in north-central Nebraska. During the 2004 and 2005 regulated waterfowl hunting season, sport hunters killed an estimated 2,424 and 3,617 Shovelers, respectively, in Nebraska (http://www.fws.gov/ migratorybirds/reports/HIP/CFHIPdatabook2006.pdf). The BBS trend data indicate that Shovelers have slightly decreased in Nebraska, but have increased in USFWS Region 6 and the BBS Western Region (Sauer et al. 2008).

Non-lethal methods were used to disperse 50 Shovelers in FY03, 0 in FY04, 0 in FY05, and 6 in FY06 and shot 9 in FY06 for AI surveillance in the State (MIS 2003, 2004, 2005, 2006).

Based on an anticipated increase in requests for services, WS' lethal removal of up to 35 Shovelers annually for airport safety and protection of other resources would not adversely affect Shoveler abundance. Because Shoveler abundance appears to be increasing in USFWS Region 6 and the BBS Western Region, sport hunters killed 2,424 and 3,617 Shovelers in Nebraska in 2004 and 2005 and because of USFWS DP requirements, WS actions would result in a low magnitude of impact and have low impacts to hunting opportunities.

Green-winged Teal Biology and Population Impacts.

The Green-winged Teal is smallest of the dabbling ducks, and locally abundant throughout Nebraska and a regular spring and fall migrant across the state (http://www.ngpc.state.ne.us/ wildlife/guides/birds/showbird.asp?BirdID='64'). These birds are mostly light brown in color throughout their body, with a green patch on the speculum of both male and females, with males having a chestnut head with a green patch behind the eyes (Tekiela 2003). Teal migrate through Nebraska in both the spring and fall with the largest concentrations being found during the spring migration (Sharpe et al. 2001). During migration Green-winged Teal utilize flooded fields, meadows, ponds, marshes, lakes, and sometimes streams (Tekiela 2003). Green-winged Teal are rare breeders in Nebraska with most breeding taking place in north-central Nebraska (http://www.ngpc.state. ne.us/wildlife/guides/birds/ showbird.asp?BirdID='64').

During the 2005 regulated waterfowl hunting season, sport hunters killed an estimated 17,408 Green-winged Teal in Nebraska and 356,990 in the Central Flyway (http://www.fws.gov/ migratorybirds/reports/HIP/CFHIPdatabook2006.pdf). BBS trend data show Green-winged Teal are stable in USFWS Region 6 and relatively stable in the BBS Western Region (Sauer et al. 2008).

During FY06 WS killed 44 Green-winged Teal for AI monitoring for HPAI H5N1 (Table -1-4). WS also dispersed 50 Green-winged teal in FY03, 41 in FY04, 0 in FY05 and 3 in FY06 to reduce risks from aircraft-bird strikes (MIS 2003, 2004, 2005, 2006). Based on an anticipated increase in requests for services, WS' lethal removal of up to 20 Green-winged Teal in any one year for airport safety and protection of other resources would not adversely affect Teal abundance. Because Green-winged Teal abundance appears to be stable in USFWS Region 6 and relatively stable in the BBS Western Region, sport hunters killed 17,408 Green-winged Teal in Nebraska and 356,990 Green-winged Teal in the Central flyway and because of USFWS DP requirements, WS actions would result in a low magnitude of impact and have low impacts to hunting opportunities.

Wood Duck Biology and Population Impacts.

Wood Ducks are small dabbling ducks found in shallow backwater ponds (Tekiela 2003). They breed throughout the state of Nebraska but are restricted by the absence of tree cavities for nesting. They rarely winter in Nebraska, because their typical habitat ponds and marshes freeze (Sharpe et al 2001). The female is a small brown duck with a bright white eye-ring, and has a blue patch on her wings that is usually hidden. The male is highly colorful with a green head and crest patterned with white and black, rusty chest, with a white belly and red eyes (Tekiela 2003).

During the 2005 regulated waterfowl hunting season, sport hunters killed an estimated 4,748 wood ducks in Nebraska and 67,386 in the Central Flyway (http://www.fws.gov/migratorybirds/reports/HIP/CFHIPdatabook2006.pdf). BBS trend data show that breeding abundance of Wood Ducks has increased in Nebraska, stable in USFWS Region 6 and relatively stable in the BBS Western Region (Sauer et al. 2008).

WS conducted non-lethal management during FY03-06 to move or disperse 8 Wood Ducks in FY03 and shot 1 in FY04 from airports to reduce risks from an aircraft/bird strike. WS removed 8 Wood Ducks in FY 06 for HPAI H5N1 surveillance (MIS 2003, 2004, 2005, 2006). Based on the number of Wood Ducks lethally removed and anticipated work, WS' management of Wood Ducks in Nebraska could remove up to 10 damaging or potentially damaging birds in any one year and this removal would not adversely affect abundance. Because 4,748 birds were sport harvested in 2005 in Nebraska and 67,386 were harvested in the Central Flyway (http://www.fws.gov/migratorybirds /reports/HIP/CFHIP databook2006.pdf), WS activities would result in a low magnitude of impact on abundance and have low impacts to hunting opportunities.

Gadwall Biology and Population Impacts

Gadwalls are medium-sized, streamlined ducks with mottled brown-and-black body plumage and light brown heads. Females and males in eclipse plumage may look superficially similar to Mallards. Both sexes have a black and white wing-patch, or speculum, that is distinctive in flight. The Gadwall breeds in the northern areas of Europe and Asia and central North America. The range of this bird appears to be expanding into eastern North America. Gadwalls are a common, locally abundant, spring and fall migrant across the State and a common regular breeder in north-central Nebraska (http://www.ngpc.state.ne.us/wildlife/guides/birds/showbird.asp?BirdID='1'). The Gadwall is a bird of open wetlands, such as prairie or steppe lakes, wet grassland or marshes with dense fringing vegetation, and usually feeds by dabbling for plant food with head submerged.

It is a late nester; the female Gadwall picks the nest site, which is usually near water and surrounded by dense weeds or grass. The nest is on the ground, made of grasses and weeds and lined with down. The female lays 8 to 10 eggs, which she incubates for 24 to 27 days. Shortly after hatching, the young leave the nest and swim and find their own food. The female remains with the young until they fledge at about ten weeks of age.

The Gadwall was traditionally a duck of the Midwestern prairies and conversion of the treed landscape to a more open one has helped create habitats more inviting to Gadwalls. Range-wide, the Gadwall population fluctuates greatly, but it continues to expand its range and does not appear to be in decline overall. During the 2004 and 2005 regulated waterfowl hunting season, sport hunters killed an estimated 12,848 and 9,495 Gadwalls, respectively, in Nebraska (http://www.fws.gov/ migratorybirds/reports/HIP/CFHIPdatabook2006.pdf). BBS trend data indicate that

Gadwalls have slightly increased in Nebraska, in USFWS Region 6 and the Western BBS Region (Sauer et al. 2008).

Non-lethal methods were used to disperse 4 in FY 03, 60 in FY04, 66 in FY05 and 157 in FY 06 on airports to reduce the risk of an aircraft-bird strike (MIS 2003, 2004, 2005, 2006). WS also shot 4 Gadwalls in FY06 for AI surveillance in the State.

Based on an anticipated increase in requests for services, WS' lethal removal of up to 50 Gadwalls in any one year for airport safety and protection of other resources would not adversely affect gadwall abundance. Because Gadwall abundance appears to be increasing in Nebraska, USFWS Region 6, and in the BBS Western Region, sport hunters killed 12,848 and 9,495 gadwalls in Nebraska in 2004 and 2005 and because of USFWS DP requirements, WS actions would result in a low magnitude of impact and have low impacts to hunting opportunities.

Cattle Egret Biology and Population Impacts

The Cattle Egret is a heron native to parts of Asia, Africa and Europe, which has successfully colonized much of the rest of the world. It is a stocky white bird which has buff plumes in the breeding season. The breeding habitat of the Cattle Egret is large wetlands and it nests in colonies, often with other wading birds. It feeds in relatively dry grassy habitats, often accompanying cattle or other large mammals since it catches insects, especially grasshoppers, and other prey disturbed by these animals.

The Cattle Egret is often found in dry grassy habitats, unlike most herons which are associated with shallow water. It is uncommon to locally common in the spring and fall migration, but mostly found in the eastern and central portions of Nebraska and is a fairly common casual breeder statewide (http://www.ngpc.state.ne.us/ wildlife/ guides/birds/showbird.asp?BirdID='28')

Non-lethal methods were used to disperse 11 Cattle Egrets in FY05 and 4 in FY 06 and WS shot 2 in FY06 for AI surveillance in the State (MIS 2005, 2006).

Based on an anticipated increase in requests for services, WS' lethal removal of up to 55 Cattle Egrets in any one year for airport safety and protection of other resources would not adversely affect Cattle Egret abundance. Because Cattle Egret abundance appears to be increasing in USFWS Region 6 and the BBS Western Region, and because of USFWS DP requirements, WS actions would result in a low magnitude of impact.

American Coot Biology and Population Impacts

The American Coot is an abundant bird of fresh water that is plump, odd-looking, with oversized yellow-green feet with lobed toes (Farrand 1988). Both adult male and female are slate gray to black, have a white bill with dark band near the tip, a small white patch near the base of the tail, and prominent red eyes with a small red patch above the bill between the eyes. Smaller then most waterfowl, it is the only black, duck-like, water bird with a white bill (Tekiela 2003).

American Coots are excellent diver and swimmers, often seen in large flocks on open water. Its clumsy take-off consists of scrambling across the top of the water with wings flapping. Huge flocks of up to 1,000 Coots gather during the winter and for migration (Tekiela 2003). The breeding range extends across Canada and south to California and Florida (Farrand 1988). In Nebraska, Coots are an abundant spring and fall migrant statewide. They are also common and a locally abundant regular breeder in north-central Nebraska, and fairly common elsewhere in the State (Sharpe et al. 2001).

During FY06 WS shot eight American Coots to test and monitor for HPAI H5N1 (Table 1-4) (MIS 2006).

BBS trend data for Nebraska, USFWS Region 6 and in the Western BBS Region indicate that American Coot abundance is relatively stable (Sauer et al. 2008). Because American coot populations appear to be stable and with USFWS oversight provided, WS could take up to 190 American Coots to protect human health and safety at airports or for AI surveillance without adversely affecting Coot abundance. This level of take by WS in Nebraska would have a low magnitude of impact on American coot abundance.

Pie-billed Grebe Biology and Population Impacts

The Pied-billed Grebe is a species of the Grebe family which breeds across Canada, parts of the United States, and temperate South America. Although this species does not appear to be a strong flier, it has occurred in Europe as a rare vagrant on a number of occasions. It feeds on fish, insects, and amphibians.

WS shot 2 Pie-billed Grebes in FY06 for AI surveillance in the State (MIS 2006).

Based on an anticipated increase in requests for services, WS' lethal removal of up to 10 Pie-billed Grebes in any one year for airport safety and protection of other resources would not adversely affect Pie-billed Grebe abundance. Pie-billed Grebe abundance appears to be decreasing in Nebraska, increasing in USFWS Region 6 and stable the BBS Western Region, and because of USFWS DP requirements, WS actions would result in a low magnitude of impact.

4.3.1.1.3 WS Did Not Conduct Lethal Bird Damage Management on the Species Below, but did Provide Technical Assistance or Non-lethal Operational Bird Damage Management.

Even though WS did not provide any lethal bird damage management to reduce damage from the species below, occasions could arise whereby lethal bird damage management would be required to reduce damages or reduce health and safety risks or threats.

Feral, Free-Ranging and Domestic Birds Biology and Population Impacts

WS is requested to provide bird damage management for losses or nuisances created by feral, free-ranging, domestic, non-indigenous, and exotic birds (WS Directive 2.320). The terms "feral" and "free-ranging" relate to domestic animals which have permanently escaped confinement or have been released into the wild, rural areas, city parks, etc. Feral and free-ranging birds are not necessarily dependent upon people for food or care. A domestic duck, commonly found on farms and inter-urban lakes and ponds, is a product of the domestication of the Mallard, a larger bird than generally found in truly wild populations. Examples of other domestic or domestic hybrid birds include, Muscovy Ducks[31], Peacocks, Golden Pheasants, Monk Parakeets, etc. "Domestic" refers to animals which are generally animals such as Chickens, Turkeys, Guinea Fowl, Racing Pigeons, domestic Ducks and Geese, Ostriches, Emus, etc. and have escaped temporarily from their confinements or owners and are still totally dependent on people for food and care. "Exotic" and "non-indigenous" refers to animals not native to Nebraska which have been illegally or accidentally introduced or released in the wild.

Birds classified or termed feral, free-ranging, and domestic are not considered wildlife and are not

[31] Native populations of Muscovy Ducks exist in four counties Texas and Mexico.

afforded lawful protection or managed by the USFWS or NGPC. Therefore, no populations or population trend estimates or data exist.

In Nebraska, WS uses a combination of methods to distinguish feral ducks (unprotected) from wild ducks (protected under MBTA). Feral ducks are distinguished by feather coloration not typical of wild ducks (*i.e.,* all white, a combination of white and other colors in a random pattern (*i.e.,* mottled) or very dark plumage on hens), weight (ducks in excess of 3¾ lbs (1.7 kg) during most of the year or 4½ lbs (2.0 kg) from November through January are considered feral) and/or flight ability (*i.e.*, many domestic ducks cannot fly or fly very poorly). Flight ability alone is not used as a determining condition during the summer molt. Most feral ducks exhibit two or more of these characteristics. Feral ducks, when captured, are euthanized while wild ducks may be released to the wild in accordance with permit guidance from the USFWS.

Where practical, WS will use non-lethal methods for feral, domestic and exotic birds, including adoption of captured birds to the public when appropriate. Any lethal bird damage management by WS would be restricted to individual sites. In those cases where birds are causing damage or are a nuisance, complete removal of the local population could be desired. This would be considered beneficial to the human environment since it would be requested by the affected property owner, administrator, or resource management agency.

During FY03 through 06, WS did not capture nor kill any domestic birds; however because of the nature of domestic bird requests and operational activities WS anticipated requests for assistance in the future. Because of the status of these birds, lethal removal would not be considered to have an adverse affect on native species and of a low magnitude of impact.

Northern Flicker Biology and Population Impacts.

Flickers have a strong, sharply pointed bill for chiseling and digging into trees or branches for insects and to excavate nesting cavities. Flickers have black spots on a tanish-white breast and belly and are about 11 inches in length. Males have a black or red mustache extending from the gape of the beak to below the eyes. In summer, Flickers are distributed from Alaska to the southern regions of the U.S. (Short 1982) and migrate to Mexico and the southern United States during winter. The habitats of the Flicker are diverse, from shrub deserts and tree-bordered streams of the Great Plains to everglade hammocks, city parks, montane fir forests, and farm pastures.

Flickers diet consist of ants, termites, beetles, crickets, aphids, caterpillars, including their eggs, pupae, and larvae, and other insects obtained from trees and the ground (Short 1982). Vegetation such as berries and other fruits make up a large part of the diet in the autumn and winter. The nesting season in Nebraska begins in April. Males claim territories and attract females by drumming, vocalizing, wing flicking, and other displays. Nests are constructed in cavities of dead trees, buildings, fence posts, telephone poles, etc.

During FY 03-06, Nebraska WS did not disperse any Flickers using non-lethal techniques nor did Nebraska WS kill any Flickers (Table 4-1). Partners in Flight (PIF) determined that Nebraska has more than 300,000 Northern Flickers and the Mixed Grass Prairie (Region 19) and the Eastern Tallgrass Prairie (Region 22) hold 3 and 4%, respectively, of the total global breeding population. PIF also determined that the relative breeding density of Northern Flickers in Regions 19 and 22 are 5 (holding >50% of the maximum density of available suitable habitat) and 4 (holding 25 – 50% of the maximum density), respectively. This gives the Northern Flicker a higher than

average and moderately high average abundance[32]. Because Northern Flicker population trend data indicate that populations are healthy, WS could remove up to 10 Northern Flickers and eggs from 20 Northern Flicker nests without adversely affecting abundance. Based on the above information, this level of take by WS in Nebraska under the DP issued by the USFWS would have a low magnitude of impact and no cumulative impact on Northern Flicker abundance.

Downy Woodpecker Biology and Population Impacts

Downy Woodpeckers are seen in suburbs, orchards, shade trees, and wooded areas. They appear similar to hairy woodpeckers, only smaller; at approximately 6.5 inches in length. Downy woodpeckers have plumage that is a sharply contrasting pattern of blacks and whites. The downy woodpecker breeds over a widespread area encompassing most of North America, except for the extreme southwestern United States and areas below tree line.

During FY 03 through 06, Nebraska WS did not remove any downy woodpeckers to protect resources and did not disperse any Downy Woodpeckers using non-lethal techniques. Between FY 03 and 06, WS responded to one requests for assistance to resolve damage problems from Downy Woodpeckers. After an on-site investigation and damage assessment, Nebraska WS recommended that one DP be issued by the USFWS.

The estimated Downy Woodpecker population in Nebraska is 100,000 with Nebraska having about 0.8% of the estimated global population (http://rmbo.org/pif_db/laped/PED3.aspx). BBS trend data for Nebraska, USFWS Region 6 and in the Western BBS Region indicate that downy woodpecker abundance is stable (Sauer et al. 2008). Based on an anticipated increase in requests for services, WS' lethal removal of Downy Woodpeckers in Nebraska could remove up to 10 damaging or potentially damaging birds and eggs from 10 nests in any one year as permitted by the USFWS without adversely affecting Downy Woodpecker abundance. Based on the above information, USFWS oversight and WS limited lethal take of Downy Woodpecker in Nebraska, WS would have a low magnitude of impact on this species.

Sharp-shinned Hawk Biology and Population Impacts

Sharp-shinned Hawk is the smallest and most common North American accipiter, with widespread wings, long tail, and has a flight consisting of quick flaps interspersed with glides. It is commonly confused with Cooper's Hawk (Farrand 1988). Both sexes are similar with females larger. Juveniles are the same size as adults with brown back, heavily streaked breast, and yellow eyes. Primary food source is birds and small mammals (Tekiela 2003).

The Sharp-shinned Hawk is common in backyards and woodlands during winter, frequently seen preying on birds visiting feeders. The short rounded wings and long tail allow the Hawk to navigate through thick brush and trees in pursuit of prey (Tekiela 2003). Breeding range extends from Alaska across Canada, south to the southern United States while wintering from northern United States south to Central America (Farrand 1988). Sharp-shinned Hawks are uncommon to Nebraska, but are a regular spring and fall migrant statewide (Sharpe et al. 2001) The estimated Sharp-shinned Hawk population in Nebraska is 100 (http://rmbo.org/pif_db/laped/PED3.aspx).

WS did not use lethal methods in FY03 through FY06 to remove any Sharp-shinned Hawks, but did use non-lethal methods to disperse 7 Hawks in FY03, 3 Hawks in FY04, 4 in FY05 and 2 in FY06 and relocated 10 during this time to reduce risks of an aircraft-bird strike (MIS 2003, 2004,

32 Partners in Flight Website (www.rmbo.org/pif) and 2005 Handbook on Species Assessment (www.rmbo.org/pubs/downloads/ Handbook2005. pdf)

2005, 2006). WS could remove 7 damaging or potentially damaging birds in one year under permit from the USFWS without adversely affecting abundance. WS activities would result in a low magnitude of impact on Sharp-shinned Hawk abundance.

Bald Eagle Biology and Population Impacts

Bald Eagles are unnoticeably smaller in body size and weight than Golden Eagles, but have a slightly wider wing span. Mature Bald Eagles have a distinct white head and tail and legs are unfeathered. They have a much heavier bill than Golden Eagles. Immature Bald Eagles are easily mistaken for Golden Eagles since the two species' coloration is similar. Bald Eagles are normally found in Nebraska near large bodies of water, rivers and creeks, and marshes. Food habits of Bald Eagles are varied and they partake in scavenging more often than hunt for live prey. It is not uncommon to find Bald Eagles feeding on livestock carcasses or carcasses of deer, fish and animals killed near highways.

The Bald Eagle is provided Federal protection through the MBTA and the BGEPA which prohibits, except under certain specified conditions, the taking, possession, and commerce of such birds, and assesses penalties for violating the Acts. In recent years Bald Eagles have attempted to nest every summer near large bodies of water and in 1996 there were 10 documented nests (J. Jorgensen, NGPC, Bald Eagle Nest Survey, pers. comm. 2007). The number of Bald Eagles nesting in Nebraska has increased steadily since 1991. A total of 858 Eagles were observed in Nebraska in 2006. In 2006, there were 63 nests surveyed with 45 active nests; over the past 20 years Bald Eagle have constructed nests in 61% of Nebraska counties (N=93 counties). The number of young produced in 2006 was 55 from 34 nests; the fledge ratio was 1.6 birds per nest in comparison the average number of young fledge from 1991 to 2004 was also 1.6. The Nebraska Bald Eagle population is producing at a rate above the 1.0 young per nest needed for recovery. A total of 432 Bald Eagles have been produced in Nebraska since 1991. In addition, USFWS Region 6 BBS data indicate that populations are increasing (Sauer et al. 2008). During FY02 through FY06, WS did not use lethal means to remove any Bald Eagles but did use non-lethal methods in FY06 to disperse two Bald Eagles at an airport to protect human health and safety and prevents aircraft-bird strikes as authorized by a permit from the USFWS. Base on population increases and range expansion, the Bald Eagle has been delisted from protection of the ESA in Nebraska.

WS did not recommend the issuances of any DPs. WS activities have and are expected to continue to be nonlethal harassment to reduce risks of an aircraft-bird strike and risk to the traveling public and these activities would have a low magnitude of impact on Bald Eagle abundance.

Other Target Species

Target species, in addition to the bird species analyzed above, could be killed or have nests removed in small numbers by WS during damage management activities. Most of these birds are protected by the USFWS under the MBTA and the take is limited by permit. Therefore, these birds are taken in accordance with applicable State and Federal laws and regulations authorizing take of migratory birds and their nest and eggs on a case-by-case basis. The USFWS, as the agency with management responsibility, could impose restrictions on depredation harvest as needed to assure cumulative take does not adversely affect the continued viability of populations. This should assure that cumulative impacts on these bird populations would have no significant adverse impact on the quality of the human environment.

Based upon an anticipated increase in future requests for WS assistance, WS activities conducted

under an emergency situation and reported within 72 hours to the USFWS could be conducted as authorized through USFWS DP. None of the "other target species" are expected to be taken by Nebraska WS at any level that would adversely affect overall bird abundance and would have a low magnitude of impact.

4.3.1.2 Alternative 2 - Technical Assistance Only.

Under this alternative, WS would have no adverse effect on target species abundance directly. Private efforts to reduce or prevent damage and perceived disease transmission risks to livestock or human health and safety risks could increase, resulting in increased potential impacts on those bird species and humans. For the same reasons shown in Section 4.3.1.1, it is unlikely that Starlings, Feral Pigeons or other target species' populations would be adversely affected by implementation of this alternative. Impacts and hypothetical risks of illegal toxicant use would be greater under this alternative than Alternative 1 (Schueler 1993, Allen et al. 1996, USFWS 2003, Porter 2004). DRC-1339 and AC are currently only available for use by WS employees. It is hypothetically possible that frustration caused by the inability to reduce losses would lead to illegal use of toxicants by others which could increase adverse effects however to an unknown degree, based on case-by-case use by others.

4.3.1.3 Alternative 3 - No WS Bird Damage Management.

Under this alternative, WS would not have any impact on target species' populations in the State or region. Private efforts to reduce or prevent depredations would increase which could result in varying degrees of impacts to target species. Impacts to target species under this alternative could be the same, less, or more than those of the current or proposed program depending on the level of effort expended. For the same reasons shown in the population impacts analysis in Section 4.3.1.1, it is unlikely that Starlings, Feral Pigeons or most other target species populations would be adversely affected by implementation of this alternative. AC and DRC-1339 are currently only available for use by WS employees. It is hypothetically possible that frustration caused by the inability to reduce losses would lead to illegal use of toxicants by others which could increase impacts (Schueler 1993, Allen et al. 1996, USFWS 2003, Porter 2004).

4.3.2 Effects of WS Bird Damage Management on Non-target Species Populations Including T/E Species.

4.3.2.1 Alternative 1 - Continue the Current WS Adaptive Integrated Bird Damage Management Program (No Action/Proposed Action).

Adverse Effects on Non-target (non-T/E) Species. Direct affects occur to non-target species when WS program personnel inadvertently kill, injure, or harass animals that are not target species. In general, these effects result from the use of methods that are not completely selective for target species. Non-target migratory bird species and other non-target wildlife species are usually not affected by WS' management methods, except for the occasional scaring from harassment devices. In these cases, migratory birds and other affected non-target wildlife may temporarily leave the immediate vicinity of scaring, but would most likely return after conclusion of the action. WS' take of non-target species during bird damage management activities have been extremely low and are not expected to increase above current levels of take.

According to Nebraska WS Annual Reports, no non-target birds are known to have been killed during bird damage management from FY03 through 06 (MIS 2003, 2004, 2005, 2006). If DRC-1339 prebaiting observations or prior history suggest a likelihood of non-target bird presence, then any treated bait applied to a site would be constantly monitored to ensure that non-target

birds do not arrive and consume bait. Alternatively, some type of structure or feeding station could be used that would only allow access by the target species but not by non-target birds, or the baiting is not conducted until non-target species are not present.

While every precaution would be taken to safeguard against killing or harming non-target birds, at times changes in local flight patterns and other unanticipated events could result in the incidental harm of unintended species. These occurrences are rare, have not happened during WS activities in the recent past and would not affect the overall health and viability of any species under the current program.

Beneficial Effects on Non-target Species. Programs to reduce damage and interspecific competition between native species and invasive species can benefit native wildlife species that are adversely affected by predation or competition for habitat. Interspecific nest competition has been well documented with some non-indigenous species. Miller (1975) and Barnes (1991) reported Starlings were responsible for a severe depletion of the Eastern Bluebird (*Sialis sialis*) population due to nest competition. Nest competition by starlings has also been known to adversely affect American Kestrels (Nickell 1967, Von Jarchow 1943, Wilmers 1987), Red-bellied Woodpeckers (Ingold 1994, Kerpez and Smith 1990), and Wood Ducks (Shake 1967, Heusmann et al. 1977, Grabill 1977, McGilvery and Uhler 1971). Weitzel (1988) reported nine native species of birds have been displaced by Starling nest competition, and Mason et al. (1972) reported Starlings evicting bats from nest holes. Reduction of nest site competition could be a beneficial effect for some native species. Although such reductions are not likely to be significant, the benefits would probably outweigh any adverse effects from non-target takes.

Interspecific brood parasitism is defined as the laying of an egg or eggs by one species of bird into a host nest of another species of birds. Unsuspecting of the egg laying, the host normally accepts and incubates the egg(s) and raises the young as their own. The Brown-headed Cowbird is one of five species of Cowbirds that are brood parasites (Orians 1985) which have lost the instinct to nest build, egg incubate, and care for young (Smith 1977). As a result of the brood parasitism, egg and chick survival of the hosts is jeopardized. In most cases of brood parasitism, the young of the host species die because they are unable to compete with the Cowbird chick for food and space inside the nest. Gulls are generally very aggressive nesting area colonizers and will force other species such as Terns and Plovers from prime nesting areas. This alternative has the greatest possibility to successfully reduce bird damage and conflicts to wildlife species since all bird damage management methods could be implemented or recommended by WS.

T/E Species Effects. Special efforts are made to avoid jeopardizing T/E species through biological assessments of the potential effects and the establishment of special restrictions or minimization measures. A Section 7 Programmatic Consultation and USFWS Biological Opinion between the USFWS and WS (USFWS 1992), determined that certain damage management methods could have a "may affect" on American Peregrine Falcons[33] *Falco peregrinus*), Bald Eagles[23], and Whooping Cranes. The BO concluded that damage management methods previously mentioned in this EA, which are used in bird damage management, will not jeopardize the continued existence or adversely modify critical habitats of those species. However, the BO did conclude that DRC-1339 may adversely affect the Whooping Crane. Minimization measures to avoid negative affects to T/E species, such as bait placement within or under structures, as well as label restrictions and the inherent safety of DRC-1339 preclude hazards to non-target and T/E species as described in USDA (1997 Appendix F) and in Section 3.5 of this EA. Furthermore, WS has determined that the use of AC and lasers will have no effect

33 Since the completion of USFWS (1992), the Peregrine Falcon and Bald Eagle have been delisted.

on any listed T/E species. Further, minimization measures/SOPs would assure there would be no jeopardy to T/E species, or adverse effects on mammalian, or non-T/E bird scavengers.

WS has reviewed the current listed and candidate species and determined that the proposed action would have no affect on federally listed species found in Nebraska. SOP's listed in Chapter 3 preclude negative effects and the low non-target risk associated with WS methods precludes other adverse effects. In addition, WS bird damage management may benefit some of the species of special concern (*e.g.,* Starling damage management could potentially reduce secondary nest cavity competition). In addition, listed species should benefit from this alternative because of the control in issuing permits to minimize effects at known sites. Some disturbance could occur to listed species; however, the USFWS monitors T/E species to insure no adverse effects to listed species.

4.3.2.2 Alternative 2 - Technical Assistance Only.

Adverse Effects on Non-target Species, including T/E Species. Alternative 2 would not allow any WS operational bird damage management in Nebraska. There would be no adverse effect on non-target or T/E species from WS bird damage management under this alternative. Technical assistance or self-help information would be provided when requested to airport managers, agricultural producers, property owners, or others. Although technical assistance could lead to more selective use of bird damage management methods by private entities than that which would occur under Alternative 3, private efforts to reduce or prevent damage could result in less experienced persons implementing bird damage management methods and lead to a greater take of non-target wildlife; hazards to T/E species could be greater under this alternative than Alternative 1. It is possible that, similar to Alternative 3, frustration from the resource owner due to the inability to reduce losses could lead to illegal use of toxicants, or other non-specific damage management methods by others could lead to unknown affects to non-target species populations, including T/E species. Potential hazards and threats to T/E species could therefore be greater under this alternative if methods that are less selective or toxicants that cause secondary poisoning are used by frustrated private individuals (Schueler 1993, Allen et al. 1996, USFWS 2003, Porter 2004).

Beneficial Effects on Non-target Species. The ability to reduce negative affects caused by birds to wildlife species and their habitats, including T/E species, would be variable based upon the skills and abilities of the person implementing actions. It would be expected that this alternative would have a greater chance of reducing damage than Alternative 3 since WS would be available to provide information and advice but less than Alternative 1.

4.3.2.3 Alternative 3 - No WS Bird Damage Management.

Adverse Effects on Non-target Species. Alternative 3 would not allow any WS bird damage management in Nebraska. There would be no impact on non-target or T/E species from WS bird damage management under this alternative. However, private efforts to reduce or prevent damage could increase; resulting in less experienced persons implementing damage management methods and could lead to greater take of non-target wildlife than the *No Action/Proposed Action* Alternative. Hazards to nontarget and T/E species could, therefore, be greater under this alternative than Alternative 1. As in Alternative 2, possible frustrations caused by the inability to reduce losses could lead to illegal use of toxicants by others which could impact local non-target species populations, including T/E species.

Beneficial Effects on Non-target Species. The ability to reduce negative affects caused by

birds to wildlife species and their habitats, including T/E species, would be variable based upon the skills and abilities of the person implementing control actions and methods used (Schueler 1993, Allen et al. 1996, USFWS 2003, Porter 2004).

4.3.3 Risks Posed by WS Bird Damage Management Methods to the Public and Domestic Pets.

The effects on safety from WS bird damage management include potential benefits by fostering a safer environment by reduced disease transmission and aircraft-bird strike risks, and potential negative effects that might result from the exposure of the public to bird damage management methods. WS uses chemical methods that are deemed appropriate to reduce a variety of damage problems, and WS personnel are aware of the potential risks to non-target species and humans (See Appendix C for a description of bird damage management methods and chemicals potentially used by WS). The use of pesticides by WS is regulated by the EPA through the FIFRA, by State law, the NDA and by WS Directives. Along with effectiveness, cost and social acceptability, risk is an important criterion for the selection of damage management strategies. Determination of risks to non-target animals, the public, and WS personnel are important prerequisites for successful application of the IWDM approach. Based on a thorough Risk Assessment (USDA 1997 Appendix P), APHIS concluded that, when chemicals used by WS, are used according to label directions, they are selective for target individuals or populations, and such use has negligible adverse effects on the environment.

4.3.3.1 Alternative 1 - Continue the Current WS Adaptive Integrated Bird Damage Management Program (No Action/Proposed Action).

Under this alternative, bird damage management conducted by WS in Nebraska is guided by WS, APHIS, and USDA Directives, Cooperative Agreements and MOUs with other agencies, USFWS (1992), and Federal, State, and local law and regulations. WS is not aware of any record of harm or injury that has occurred to the public or pets as a result of WS bird damage management in Nebraska. The bird damage management methods used by Nebraska WS are discussed in more detail in Appendix C of this EA and USDA (1997) and used as prudently as possible. In addition, the current damage management strategies will continue to address complaints on a case-by-case basis providing the most flexibility in addressing damage complaints.

Avitrol (4-Aminopyridine) is available as a prepared grain bait mixture or as a powder. It is formulated in such a way that ratios of treated baits to untreated baits are no greater than 1:9. Factors that virtually eliminate health risks to members of the public from use of this product as an avicide are:

- It is readily broken down or metabolized into compounds that are excreted in urine in the target species (Extoxnet 1996). Therefore, little of the chemical remains in birds killed with avitrol to present a hazard to humans or pets.
- A human or pet would need to ingest the internal organs of birds found dead from Avitrol ingestion to have any chance of receiving even a minute amount of the chemical or its metabolites into their system. This is highly unlikely to occur. Furthermore, secondary hazard studies with mammals and birds have shown that there is virtually no hazard of secondary poisoning.
- Although Avitrol has not been specifically tested as a cancer-causing agent, the chemical was found not to be mutagenic in bacterial organisms. Therefore, the best scientific information available indicates it is not a carcinogen. Notwithstanding, the extremely controlled and limited circumstances in which Avitrol is used would prevent exposure of members of the public to this chemical.

The above analysis indicates that human and pet health risks from Avitrol use would be virtually nonexistent.

DRC-1339 is the primary avicide used for bird damage management in Nebraska. This chemical is one of the most extensively researched and evaluated pesticides ever developed. More than 30 years of studies have demonstrated the safety and efficacy of this compound. Factors that help eliminate any risk of public health problems from possible future use of this chemical are:

- Its use is prohibited within 50 feet of standing water and cannot be applied directly to food or feed crops (contrary to some misconceptions, DRC-1339 is not applied to feed materials that livestock can access).
- DRC-1339 is highly unstable and degrades rapidly when exposed to sunlight, heat, or ultraviolet radiation. The half-life is about 25 hours; in general, treated bait material is nearly 100% broken down within a week.
- It is more than 90% metabolized in target birds within the first few hours after they consume the bait. Therefore, little material is left in bird carcasses that may be found or retrieved by people or pets.
- Application rates are extremely low (less than 0.1 lb. of active ingredient per acre).
- A human or pet would need to ingest the internal organs of birds found dead from DRC-1339 to have any chance of receiving even a minute amount of the chemical or its metabolites into his/her system. This is highly unlikely to occur.
- The EPA has concluded that, based on mutagenicity (the tendency to cause gene mutations in cells) study, this chemical is not a mutagen or a carcinogen (*i.e.,* cancer-causing agent). Regardless, however, the extremely controlled and limited circumstances in which DRC-1339 is used would prevent any exposure of the public to this chemical.

The above analysis indicates that human and pet health risks from use of DRC-1339 would be virtually nonexistent under any alternative.

Alpha-chloralose. AC is a chloral derivative of glucose and a central nervous system depressant (*i.e.,* depresses cortical centers in the brain) used to immobilize and capture nuisance waterfowl and other birds, and for capture of birds for research purposes[34]. It typically used in recreational and residential areas, such as swimming pools, shoreline residential areas, golf courses, or resorts for the capture of birds. AC is typically delivered in small baits with minimal hazards to pets and humans and the target birds; single bread or corn baits are fed directly to the target birds. WS personnel or other authorized personnel are present at the site of application during baiting to retrieve the immobilized birds. Unconsumed baits are removed from the site following each treatment.

- The solubility and mobility are believed to be moderate and environmental persistence is believed to be low.
- Bioaccumulation in plants and animal tissue is believed to be low. AC is used in other countries as an avian and mammalian toxicant.
- The compound is slowly metabolized, with recovery occurring a few hours after administration (Schafer 1991). The dose used for immobilization is designed to be about two to 30 times lower than the LD_{50}.
- Toxicity to aquatic organisms is unknown (Wornecki et al. 1990) but the compound is not

34 With proper use and follow-up, AC reduces the potential for stress, injury and death in many situations over other capture techniques.

generally soluble in water and therefore should remain unavailable to aquatic organisms.

The above analysis indicates that human and pet health risks from use of AC would be virtually nonexistent under any alternative.

Carbon dioxide (CO_2) gas is a colorless, odorless, noncombustible gas approved by the AVMA as a euthanasia method (Beaver et al. 2001) and is a common euthanasia agent apparently because of its ease of use, safety, and ability to euthanize many animals in a short time span. The advantages for using CO_2 are: 1) the rapid depressant, analgesic, and anesthetic effects of CO_2 are well established, 2) it is readily available and can be purchased in compressed gas cylinders, 3) it is inexpensive, nonflammable, nonexplosive, and poses minimal hazard to personnel when used with properly designed equipment, and 4) it does not result in accumulation of tissue residues.

Other Bird Damage Management Chemicals. Non-lethal bird damage management chemicals that might be used or recommended by WS would include repellents such as: 1) methyl or di-methyl anthranilate (artificial grape flavoring used in foods and soft drinks sold for human consumption), which has been used as an area repellent, 2) anthraquinone, another repellent, presently marketed as Flight Control™, 3) Mesurol, a chemical repellent used for non-lethal taste aversion, and 4) the tranquilizer AC. Such chemicals must undergo rigorous testing and research to prove safety, effectiveness, and low environmental risks before EPA or Food and Drug Administration (FDA) will register them. Any operational use of these chemicals would be in accordance with labeling requirements under FIFRA, FDA and State laws and regulations which are established to avoid unreasonable adverse effects on the environment.

Following labeling requirements and use restrictions are built-in minimization measures that would assure that use of registered chemical products would avoid significant adverse effects on human or pet health. Based on a thorough Risk Assessment, APHIS concluded that, when WS program chemical methods are used in accordance with label directions, they are highly selective to target individuals or populations, and such use has negligible effects on the environment (USDA 1997).

Mechanical Damage Management Methods

Many mechanical damage management methods may be used or recommended by WS to reduce damage or the potential for damage (Appendix C). Some of these methods include:

- Resource management, which include practices that, may be used by resource owners to reduce the potential for wildlife damage.
- Cultural practices which generally involve modifications to the level of care or attention given to the resource, which may vary depending on the age, size, and location of the resource.
- Environmental/Habitat Modification is an integral part of bird damage management to not produce or attract certain bird species or to repel certain birds. Most habitat management revolves around airports and aircraft-bird strike risks.
- Animal Behavior Modification refers to tactics that alter the behavior of wildlife and reduce damages. Animal behavior modification may use scare tactics or exclusion to deter or repel birds that cause loss or damage (Twedt and Glahn 1982). Termination of artificial feeding may also prove beneficial.

- Live traps which are enclosure traps made of nylon netting or hardware cloth and come in many different sizes and designs, depending on the species of birds being captured. Traps are baited with grains or other food material, which attract the target birds.
- Egg addling/destruction is the practice of destroying the embryo prior to hatching.
- Shooting is more effective as a dispersal technique than as a way to reduce bird densities when a large number of birds are present, however, some birds may be removed using shooting when warranted (*e.g.*, at airports if the bird will not leave the area).
- Snap traps are wooden based rat snap traps and can be used effective in killing offending birds, such as woodpeckers damaging structures.

4.3.3.2 Alternative 2 -Technical Assistance Only Program.

Under this alternative, operational bird damage management assistance by WS would not be authorized in the State. Therefore, less selective use of methods by individuals less experienced in their application could occur. WS would only provide advice and, in some cases, equipment or materials *(i.e.,* by loan) to persons who would then conduct their own damage management actions. Concerns about human or pet health risks from WS' use of bird damage management chemical methods would be alleviated because no such use would occur. Private efforts to reduce or prevent damage would be expected to increase, resulting in less experienced persons implementing chemical or other damage management methods and leading to a greater risk than the current and proposed action.

Commercial pest control services would be able to use Avitrol if certified and such use would likely occur to a greater extent in the absence of WS' assistance. Use of Avitrol, in accordance with label requirements, should preclude any hazard to members of the public or pets. However, hazards to humans and pets could be greater under this alternative if chemicals that are less selective or that cause secondary poisoning are used. Frustration caused by the inability to reduce losses could lead to illegal use of toxicants by others which could lead to unknown impacts to humans and pets (Schueler 1993, Allen et al. 1996, USFWS 2003, Porter 2004). Hazards to humans and pets could be greater under this alternative than Alternative 1 if chemicals that are less selective or that cause secondary poisoning are used.

4.3.3.3 Alternative 3 - No WS Bird Damage Management Program.

Alternative 3 would not allow any WS bird damage management in Nebraska. The absence of WS bird damage management in Nebraska could result in adverse effects on human health and safety because of the possibility of bird-borne diseases and increases in bird strikes on aircraft. Property managers fear that the absence of bird damage management activities would lead to accumulation of bird droppings and feathers (*i.e.,* Feral Pigeons, Starlings, etc.) near rooftop ventilation systems and work areas which may increase the risk of disease transmission or other health risks to humans. Blackbirds, Starlings, English Sparrows, and Feral Pigeons often cause damage by congregating in large numbers and defecate on fences, shade canopy structures, and other structures, which can accelerate corrosion of metal components and which generally is considered an unsightly nuisance and potential health hazard. WS assists airport management who seek to resolve wildlife hazards to aviation in Nebraska. Airport managers and air safety officials are concerned that the absence of a WS bird damage management program would fail to adequately address complex wildlife hazard problems faced by the aviation community. Hence, potential effects of not conducting such work could lead to an increased incidence of human injuries, property damage or loss of life due to bird strikes to aircraft.

However, commercial pest control services and private individuals would be able to use Avitrol, if certified and such use would likely occur to a greater extent in the absence of WS' assistance,

potentially resulting in less experienced persons implementing damage management methods and leading to a greater risk than the *No Action/Proposed Action* Alternative. Use of Avitrol, in accordance with label requirements, would preclude any hazard to members of the public. However, hazards to humans and pets could be greater under this alternative if other chemicals that are less selective or that cause secondary poisoning are. It is hypothetically possible that frustration caused by the inability to alleviate bird damage could lead to illegal use of certain toxicants, and could pose secondary poisoning hazards to pets and to mammalian and avian scavengers under this Alternative used (Schueler 1993, Allen et al. 1996, USFWS 2003, Porter 2004). Some chemicals that could be used illegally would present greater risks of adverse effects on humans than those used under the current program alternative.

4.3.4 Efficacy of WS Bird Damage Management Methods.

Under the current program, all methods are used as effectively as practically possible, in conformance with the WS Decision Model (Slate et al. 1992) and WS Directives. The efficacy of each method is based, in part, on the application of the method, the skill of the personnel using the method and the guidance provided by WS Directives and policies for WS personnel.

The efficacy of each alternative is based on the types of methods employed under that alternative. WS personnel are trained in the use of each method, and are certified by the NDA as restricted-use pesticide applicators for each pesticide that is used. Some methods may be more or less effective, or applicable depending on weather conditions, time of year, biological considerations, economic considerations, legal and administrative restrictions, or other factors. Because these various factors, may at times, preclude use of certain methods, it is important to maintain the widest possible selection of damage management methods to most effectively resolve bird damage problems (see Appendix C for a more detailed discussion of methods).

4.3.4.1 Alternative 1 - Continue the Current WS Adaptive Integrated Bird Damage Management Program (No Action/Proposed Action).

The following are some methods that would be available under Alternative 1 (Appendix C).

Animal Behavior Modification. This refers to tactics that alter the behavior of wildlife and reduce damages. Animal behavior modification may use scare tactics or exclusion to deter or repel birds that cause loss or damage (Twedt and Glahn 1982).

Methyl anthranilate (MA) is a non-lethal bird repellent derived from a human food additive. The chemical is effective in reducing bird food consumption and area-use and is selective in that it primarily repels birds.

Mesuoral is a chemical repellent used for non-lethal taste aversion. It is registered by the EPA for aversive conditioning egg treatment to reduce predation from common ravens, white-necked ravens (*Corvus cryptoleucas*), and American crows on the eggs of protected species, T/E species, or eggs of other species designated to be in need of special protection (EPA Reg. No. 56228-33). Mesurol is registered for WS use only.

Anthraquinone (Flight Control) is secondary repellent causing illness or discomfort in birds after ingestion. The effectiveness of this chemical is based on the concept of conditioned food avoidance as the chemical may cause vomiting and gastrointestinal discomfort in birds.

Alpha chloralose (AC) is delivered as bait to targeted birds and is selective and effective in immobilizing targeted individuals. Some unintentional mortality may occur due to differences in target bird weight, aggressiveness in feeding, or post baiting behavior.

Lasers are selective and an effective non-lethal method to disperse some bird species under the correct lighting conditions and present virtually no health hazards to the birds (APHIS 2001). However, lasers may have some restricted use on airports under FAA Advisory Circular AC#70-1: Outdoor Laser Operations.

Live traps are used in locations where a targeted population is causing damage or where other techniques cannot be safely used. Live traps, as applied and used by WS, are highly selective for target species. If a non-target is accidentally captured it would be released unharmed.

Nest box traps are effective and selective in capturing secondary cavity nesting birds (DeHaven and Guarino 1969, Knittle and Guarino 1976).

Snap traps are used to remove individual birds, primarily Northern Flickers and other woodpeckers, that are causing damage. Effectiveness can be increased by placing the traps near where the damage is occurring and by baiting the trap with food items which are highly attractive to the targeted species and less attractive to non-target birds.

Nest destruction is selective for targeted species/individuals because nests would be identified by species-specific characteristics and nesting material. Heusmann and Bellville (1978) reported this method effective, but time-consuming.

Egg addling/destruction is highly selective because the eggs of specific birds are targeted for destruction, no affects to other species would occur. This method is considered highly selective, but time consuming.

DRC-1339 – More than 30 years of studies have demonstrated the safety and efficacy of this compound. Prebaiting is conducted to monitor for the presence of non-target and target species consumption to increase efficacy.

Avitrol - Prebaiting is usually conducted to increase baiting efficacy and selectivity. Any granivorous bird associated with the target birds could be affected by Avitrol if it consumed treated bait. However, Avitrol only affects a very small number of birds in a baited area.

Shooting is selective for target species (USDA 1997). It would also be effective as a dispersal technique or to reinforce dispersal techniques.

There are several other bird damage management methods used by WS under the current program. Appendix C provides a description of each.

4.3.4.2 Alternative 2 - Technical Assistance Only Program.

Under this alternative, WS would not have an operational bird damage management program to assist requesters to reduce bird damage. Efficacy of the WS program would not be a consideration. Assistance would be limited to providing technical assistance and instructional demonstrations on legally available methods and self-help advice.

4.3.4.3 Alternative 3 - No WS Bird Damage Management Program.

Under this alternative, WS bird damage management would not be a consideration because the Nebraska WS program would not conduct operational activities nor provide technical assistance to entities experiencing bird damage. Private efforts to reduce or prevent damage would probably increase which could result in less efficacy in using bird damage management methods. It is reasonable to assume that frustration caused by the inability to reduce losses through legal means in a timely manner could lead to the use of illegal techniques which could result in unwanted impacts to bird populations and the environment (Schueler 1993, Allen et al. 1996, USFWS 2003, Porter 2004).

4.4 CUMULATIVE EFFECTS

Cumulative impacts, as defined by CEQ (40 CFR 1508.7), are impacts to the environment that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (Federal or non-federal) or person undertakes such other actions. Cumulative impacts may result from individually minor, but collectively significant, actions taking place over time.

Under Alternatives 1 and 2, WS would address damage associated with birds in situations throughout the State. The Nebraska WS bird damage management program would be the primary Federal program with bird damage management responsibilities; however, some State and local government agencies and individuals may conduct bird damage management activities in Nebraska as well. Through ongoing coordination and cooperation with the USFWS, FAA, USAF, NGPC, NDA and UNLE, WS is aware of other bird damage management activities and may provide technical assistance in such efforts. WS does not normally conduct operational damage management activities concurrent with other agencies in the same area, but may conduct bird damage management activities at adjacent sites within the same time frame. In addition, commercial pest control companies may conduct bird damage management activities in the same area. The potential cumulative impacts analyzed in this EA could occur either as a result of WS bird damage management, or as a result of the effects of other agencies and individuals. Those activities and the MBTA protected birds removed are tracked by the USFWS through their permitting system to insure no long-term cumulative adverse affects to bird populations. The USFWS reviews annually the take of MBTA protected migratory birds under standard conditions of DPs (50 CFR 21.41) and has the ability to determine if the cumulative effects of all take under DPs may be negatively affecting a species.

Cumulative Impacts on Wildlife Populations

Bird damage management methods used or recommended by the WS program in Nebraska will have no cumulative adverse effects on target and non-target wildlife populations. Population trend data indicate that target bird populations have remained relatively stable or increasing in Nebraska, USFWS Region 6 and the BBS Western Region. When damage management actions are implemented by WS, the potential lethal take of non-target wildlife species is expected to be minimal to non-existent.

The USFWS's Migratory Bird Program conducts a biological review of all permit applications to assess whether the requested take (species, number) would negatively impact populations of the species requested on the application. The USFWS may modify or deny the permit based on potential impacts to the birds. The USFWS also requires, in a majority of cases, damage to have occurred before a permit is issued, and requires documentation that non-lethal methods have been attempted to the extent practicable.

Cumulative Impact Potential from Chemical Components

Bird damage management programs which include the use of pesticides as a lethal means to reduce damage may have the greatest potential for cumulative impacts on the environment as such impacts relate to deposit of pesticide residues in the physical environment and environmental toxicosis. DRC-1339 is the primary pesticide currently used by the Nebraska WS bird damage management program for the purpose of reducing damage or health threats to people or livestock. This chemical has been evaluated for possible residual effects which might occur from buildup of the chemical in soil, water, or other environmental sites.

> ***DRC-1339*** exhibits a low persistence in soil or water, and bioaccumulation of the chemical is unlikely (USDA 1997). Additionally, the relatively small quantities of DRC-1339 are used in the bird damage management program in Nebraska, the chemical's instability which results in speedy degradation of the product, and application protocol used in WS programs further reduces the likelihood of any environmental accumulation.
>
> **Avitrol** exhibits a high persistence in soil and water but, according to literature, does not bioaccumulate (USDA 1997, Extoxnet 2000). Because of the characteristic of Avitrol to bind to soils, it is not expected to be present in surface or ground water as a result of its use on land. A combination of chemical characteristics and baiting procedures used by WS would reduce the likelihood of environmental accumulation of Avitrol. The EPA has not required studies on the fate of Avitrol in the soil because, based on use patterns of the avicide, soil residues are expected to be low.
>
> **Alpha-chloralose.** USDA APHIS is currently authorized by FDA to use AC to capture waterfowl, coots, pigeons and ravens under Investigative New Animal Drug (INAD) 6602 under a category of nuisance animals. AC is a central nervous system depressant (*i.e.,* depresses cortical centers in the brain) used to immobilize and capture birds. The solubility and mobility of AC are believed to be moderate and environmental persistence is believed to be low. Bioaccumulation in plants and animal tissue is believed to be low. AC is slowly metabolized, with recovery occurring a few hours after administration (Schafer 1991). Factors supporting the low potential for harm included the lack of exposure to pets, nontarget species and the public, and the low toxicity of the active ingredient.

Based on potential use patterns, the chemical and physical characteristics of DRC-1339 and Avitrol, and factors related to the environmental fate of these pesticides; no cumulative impacts are expected from the chemical components used or recommended by the WS bird damage management program in Nebraska. Avitrol may be used or recommended by the Nebraska WS program. All WS applications would be in compliance with EPA label specifications.

Non-lethal chemicals may also be used or recommended by the WS bird damage management program in Nebraska. Characteristics of these chemicals and potential use patterns indicate that no significant cumulative impacts related to environmental fate are expected from their use in WS bird damage management program in Nebraska.

Cumulative Impact Potential from Non-chemical Components

Non-chemical methods used or recommended by WS' bird damage management program may include exclusion through use of various barriers, localized habitat modification of structures or vegetation, live trapping and euthanasia of birds, harassment of birds or bird flocks, nest and egg destruction, and shooting.

Because shooting may be considered as a component of the non-chemical, the deposition of lead shot in the environment is a factor considered in this EA.

> ***Lead Shot.*** Threats of lead toxicosis to waterfowl from the deposition of lead shot in waters where such species fed were observed more than one hundred years ago (Sanderson and Belrose 1986). As a result of discoveries made regarding impacts to several species of ducks and geese, Federal restrictions were placed on the use of lead shot for waterfowl hunting in 1991. *"Beginning September 1, 1991, the contiguous 48 United States, and the States of Alaska and Hawaii, the Territories of Puerto Rico and the Virgin Islands, and the territorial waters of the United States, are designated for the purpose of Sec. 20.21 (j) as nontoxic shot zones for hunting waterfowl, coots, and certain other species. "Certain other species" refers to those species, other than waterfowl or coots, affected by reason of being included in aggregate bags and concurrent seasons."*
>
> All Nebraska WS bird damage management shooting activities conform to Federal, State and local laws. To comply with the "Standard Conditions" of migratory bird permits issued by the USFWS, WS uses non-toxic shot during activities conducted under those permits. Consequently, no deposition of lead in nontoxic shot zones would occur as a result of Nebraska WS' bird damage management actions. Therefore, cumulative impacts are not likely to occur if lead shot is used.
>
> **Roost Harassment/Dispersal.** Some potential exists for cumulative impacts to human health and safety related to the harassment of large flocks of birds in urban environments. If birds are dispersed from one site and relocate to another where human exposure to concentrations of bird droppings over time occurs, human health and safety could be threatened. If WS is providing operational assistance in relocating such birds, coordination with local authorities would be conducted to assure they do not re-establish in other undesirable locations.

SUMMARY

No significant cumulative environmental impacts are expected from any of the alternatives analyzed in this EA. Under the Current/Proposed Action, the lethal removal of birds by WS would not have a significant impact on overall bird populations in Nebraska or USFWS Region 6, but some local reductions may occur. No risk to public safety is expected when WS' services are provided and accepted by requesting individuals under Alternative 1 since only trained and experienced wildlife biologists/ specialists would conduct and recommend bird damage management activities. There is a slight increased risk to public safety when persons who reject WS assistance and recommendations in Alternative 1 and conduct their own bird damage management, and when no WS assistance is provided in Alternative 3. Under all three Alternatives, however, it would not be to the point that the impacts would be significant. Although some persons will likely be opposed to Nebraska WS' participation in bird damage management activities, the analysis in this EA indicates that WS integrated bird damage management program would not result in significant cumulative adverse impacts on the quality of the human environment. Table 4-7 summarizes the expected impact of each of the alternatives on each of the issues.

Table 4.7 Comparisons of Issues/Impacts and Alternatives.

Issues/Impacts	*Alternative 1*	*Alternative 2*	*Alternative 3*
Effects of WS Bird Damage Management on Target Species Populations	WS would have no affect on bird abundance. If resource owners conduct bird damage management, effects could be more than Alternative 2 or 3.	Affects similar to Alternative 1, however could be more adverse depending on the level of control by others.	Affects similar to Alternative 1, however could be more adverse depending on the level of control by others.
Effects on non-target species, including T/E species	No adverse affects from WS activities. Potential positive effects to those species that are being negatively impacted by invasive target species.	No adverse affects from WS activities. Potential adverse affects from others if toxicants or other methods are misused.	No adverse affects from WS activities. Potential adverse affects from others if toxicants or other methods are misused.
Risks Posed by WS Bird Damage Management Methods to the Public and Domestic Pets	No adverse affects from WS activities. Potential positive effect from reduced risks from bird disease transmissions or aircraft-bird strikes.	Potential negative affect from the misuse of methods or toxicants or increase disease transmission or aircraft-bird strike risks.	Potential negative affect from the misuse of methods or toxicants or increase disease transmission or aircraft-bird strike risks.
Efficacy of WS Bird Damage Management Methods	Alternative provides most effective means to reduce bird damage or potential bird damage.	Moderate effectiveness if WS technical assistance recommendations are followed.	Least effectiveness because no professional assistance would be available to requesters.

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APPENDIX A

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APPENDIX B

AUTHORITY AND COMPLIANCE

USDA-APHIS-Wildlife Services

The USDA is directed by law to protect American agriculture and other resources from damage associated with wildlife. The primary statutory authority for the WS program is the Act of March 2, 1931, as amended (7 U.S.C. 426-426c; 46 Stat. 1468), which provides that:

> "*The Secretary of Agriculture is authorized and directed to conduct such investigations, experiments, and tests as he may deem necessary in order to determine, demonstrate, and promulgate the best methods of eradication, suppression, or bringing under control on national forests and other areas of the public domain as well as on State, Territory or privately owned lands of mountain lions, wolves, coyotes, bobcats, prairie dogs, gophers, ground squirrels, jackrabbits, brown tree snakes and other animals injurious to agriculture, horticulture, forestry, animal husbandry, wild game animals, furbearing animals, and birds, and for the protection of stock and other domestic animals through the suppression of rabies and tularemia in predatory or other wild animals; and to conduct campaigns for the destruction or control of such animals. Provided that in carrying out the provisions of this Section, the Secretary of Agriculture may cooperate with States, individuals, and public and private agencies, organizations, and institutions."*

Since 1931, with the changes in societal values, WS policies and programs place greater emphasis on the part of the Act discussing "bringing (damage) under control", rather than "eradication" and "suppression" of wildlife populations. In 1988, Congress strengthened the legislative mandate of WS with the Rural Development, Agriculture, and Related Agencies Appropriations Act. This Act states, in part:

> *"That hereafter, the Secretary of Agriculture is authorized, except for urban rodent control, to conduct activities and to enter into agreements with States, local jurisdictions, individuals, and public and private agencies, organizations, and institutions in the control of nuisance mammals and birds and those mammals and birds species that are reservoirs for zoonotic diseases, and to deposit any money collected under any such agreement into the appropriation accounts that incur the costs to be available immediately and to remain available until expended for Animal Damage Control activities."*

Further, in 2001, Congress amended WS authority in the Agriculture Appropriations Bill, which provides that:

> *"The Secretary of Agriculture may conduct a program of wildlife services with respect to injurious animal species and take any action the Secretary considers necessary in conducting the program. The Secretary shall administer the program in a manner consistent with all of the wildlife services authorities in effect on the day before the date of the enactment of the Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act, 2001."*

To fulfill this Congressional direction, WS conducts activities to prevent or reduce wildlife damage to agricultural, industrial and natural resources, property, and threats to public health and safety on private and public lands in cooperation with other Federal, state and local agencies, private organizations, and individuals. Therefore, wildlife damage management is not based on punishing animals but as one means of reducing damage, with actions being implemented using the WS Decision Model (Slate et al. 1992). The imminent threat of damage or loss of resources is often sufficient for individual actions to be

initiated. The need for action is derived from the specific threats to resources or the public. WS' mission is to improve the coexistence of people and wildlife by providing Federal leadership to reduce problems.

U.S. Fish and Wildlife Service

The USFWS is the primary Federal agency responsible for conserving, protecting, and enhancing the Nation's fish and wildlife resources and their habitats. The USFWS mission is to conserve, protect, and enhance fish and wildlife and their habitats for the continuing benefit of the American people. Responsibilities are shared with other Federal, State, tribal, and local entities; however, the USFWS has specific responsibilities for T/E species, migratory birds, inter-jurisdictional fish, and certain marine mammals, as well as for lands and waters that the USFWS administers for the management and protection of these resources.

The USFWS regulates the taking of migratory birds under the four bilateral migratory bird treaties the United States entered into with Great Britain (for Canada), Mexico, Japan, and Russia. Regulations allowing the take of migratory birds are authorized by the MBTA (16 U.S.C. Sec's. 703 - 711), and the Fish and Wildlife Improvement Act of 1978 (16 U.S.C. Sec. 712). The Acts authorize and direct the Secretary of the Interior to allow hunting, taking, and killing of migratory birds subject to the provisions of, and to carry out the purposes of, the four migratory bird treaties.

The 1916 treaty with Great Britain was amended in 1999 by the governments of Canada and the United States. Article II of the amended United States-Canada migratory bird treaty (Treaty) states that to ensure the long-term conservation of migratory birds, migratory bird populations shall be managed in accordance with conservation principles that include (among others): 1) to manage migratory birds internationally, 2) to sustain healthy migratory bird populations for harvesting needs, and 3) to provide for and protect habitat necessary for the conservation of migratory birds.

Article III of the Treaty states that the governments should meet regularly to review progress in implementing the Treaty. The review shall address issues important to the conservation of migratory birds, including the status of migratory bird populations, the status of important migratory bird habitats, and the effectiveness of management and regulatory systems. The governments agree to work cooperatively to resolve identified problems in a manner consistent with the principles of the Treaty and, if the need arises, to conclude special arrangements to conserve and protect species of concern.

Article IV of the Treaty states that each government shall use its authority to take appropriate measures to preserve and enhance the environment of migratory birds. In particular, the governments shall, within their constitutional authority, seek means to prevent damage to such birds and their environments and pursue cooperative arrangements to conserve habitats essential to migratory bird populations.

Article VII of the Treaty authorizes permitting the take and kill of migratory birds that, under extraordinary conditions, become seriously injurious to agricultural or other interests.

The USFWS regulates take of bird species that are listed as migratory under the MBTA and those that are listed as T/E under the ESA. The USFWS cooperates with the NGPC and WS by recommending measures to avoid or minimize take of T/E species. The term "*take*" is defined by the ESA (section 3(19)) to mean "*to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.*" The terms "*harass*" and "*harm*" have been further defined by USFWS regulations (50 CFR section 17.3), as follows: 1) *harass means an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering*; 2) *harm means an act which actually kills or injures wildlife. Such acts may include*

significant habitat modification or degradation when it actually kills or injures wildlife by significantly impairing essential behavioral patterns including breeding, feeding or sheltering.

The USFWS authority for action is based on the MBTA of 1918 (as amended), which implements treaties with the United States, Great Britain (for Canada), the United Mexican States, Japan, and the Soviet Union. Section 3 of this Act authorized the Secretary of Agriculture:

"From time to time, having due regard to the zones of temperature and distribution, abundance, economic value, breeding habits, and times and lines of migratory flight of such birds, to determine when, to what extent, if at all, and by what means, it is compatible with the terms of the convention to allow hunting, taking, capture, killing, possession, sale, purchase, shipment, transportation, carriage, or export of any such bird, or any part, nest, or egg thereof, and to adopt suitable regulations permitting and governing the same, in accordance with such determinations, which regulations shall become effective when approved by the President."

The authority of the Secretary of Agriculture, with respect to the MBTA, was transferred to the Secretary of the Interior in 1939 pursuant to Reorganization Plan No. II. Section 4(f), 4 Fed. Reg. 2731, 53 Stat. 1433.

Federal Aviation Administration

The FAA is the federal agency responsible for developing and enforcing air transportation safety regulations and authorized to reduce wildlife hazards at commercial and non-commercial airports. Many of these regulations are codified in the FARs. The FAA is responsible for setting and enforcing the FARs and policies to enhance public safety. For commercial airports, 14CFR, Part 139.337 (Wildlife Hazard Management) directs the airport sponsor to conduct a wildlife hazard assessment if an air carrier aircraft experiences multiple wildlife strikes or an air carrier aircraft experiences substantial damage from striking wildlife. At non-commercial airports, the FAA also expects that the airport be aware of wildlife hazards in and around their airport and take corrective action if warranted; the FAA uses Advisory Circular 150/5200-33 to guide their decision making process.

U.S. Air Force – Offutt Air Force Base

The mission of the USAF is to defend the United States and its global interests -- to fly and fight in air, space, and cyberspace. To achieve that mission, the USAF has a duty of global vigilance, reach and power. That vision focuses around three core competencies: 1) developing airmen, 2) technology-to-war fighting, and 3) integrating operations. These core competencies make six distinctive capabilities possible: 1) air and space superiority, 2) global attack, 3) rapid global mobility, 4) precision engagement, 5) information superiority, and 6) agile combat support.

Offutt Air Force Base is home to the headquarters of the United States Strategic Command, the Air Force Weather Agency, and the 55th Wing, the Fightin' Fifty-Fifth, and a variety of other important units. Offutt's diverse missions and global responsibilities put it on the cutting edge of the Air Force's transformation. Each branch of the U.S. military is represented among the approximately 12,000 military and federal employees assigned at Offutt Air Force Base.

The 55th Communications Group provides worldwide command, control, communications and computer systems, information management and combat support to warfighting and national leadership. It also provides communications technology and support to the 55th Wing and 44 tenant units. The 55th Maintenance Operations Squadron provides centralized direction of all maintenance staff functions

providing support to world-wide aircraft reconnaissance missions.

Nebraska Game and Parks Commission

The NGPC is responsible for managing all protected and classified wildlife in Nebraska, including state listed T/E species, despite the land class the animals inhabit (RSN 37-101, 37-204, 37-209, 37-211, 37-213, 37-215, 37-301, 37-432, 37-432.01, 37-434). Part of the mission of the NGPC is to promote the stewardship of the state's wildlife resources, including migratory birds and state threatened and endangered birds, in the best long term interests of the people and those resources. The NGPC is also authorized to cooperate with Nebraska WS and the NDA for controlling predatory animals.

Nebraska Department of Agriculture

The NDA currently has a MOU, agreements, and work plan with the Nebraska WS. These documents establish a relationship between the Nebraska WS, NGPC, NDA, UNCE and the Nebraska HHS, and outline responsibilities and set forth objectives and goals for each agency for resolving wildlife damage management conflicts in Nebraska and program responsibility (Supplement #2 NDA Work Plan to MOU 12-34-73-194).

Nebraska Indian Tribes

Currently, Nebraska WS does not have any MOUs with any American Indian Tribes. Any WS activities conducted on reservation lands would only be conducted at the request of the Tribe and after appropriate authorizing documents were signed. Therefore, WS would only conduct bird damage management activities on reservation lands after agreements with the Tribes to conduct such activities are in place. If WS enters into an agreement with a Tribe for bird damage management, this EA would be reviewed and supplemented if appropriate to insure compliance with NEPA. MOUs, agreements and NEPA compliance would be conducted as appropriate before conducting bird damage management on reservation lands. Requests for operational assistance to resolve bird damage complaints on private properties within the boundaries of Indian reservations would be coordinated with tribal governments.

Compliance with Federal Laws, Regulations and Executive Orders

WS consults and cooperates with other Federal and State agencies as appropriate to ensure that all WS activities are carried out in compliance with all applicable Federal laws.

National Environmental Policy Act: All Federal actions are subject to NEPA (Public Law 91-190, 42 U.S.C. 4321 et seq.). WS and the USFWS follow CEQ regulations implementing NEPA (40 CFR 1500 et seq.), USDA (7 CFR 1b), and WS follows the APHIS Implementing Guidelines (7 CFR 372) as a part of the decision-making process. These laws, regulations, and guidelines generally outline five broad types of activities to be accomplished as part of any project: public involvement, analysis, documentation, implementation, and monitoring. NEPA also sets forth the requirement that all major Federal actions be evaluated in terms of their potential to significantly affect the quality of the human environment for the purpose of avoiding or, where possible, mitigating and minimizing adverse impacts. Federal activities affecting the physical and biological environment are regulated in part by CEQ through regulations in (40 CFR, Parts 1500-1508). In accordance with CEQ and USDA regulations, APHIS Guidelines Concerning Implementation of NEPA Procedures, as published in the Federal Register (44 CFR 50381-50384) provide guidance to APHIS regarding the NEPA process.

Pursuant to NEPA and CEQ regulations, this EA documents the analysis of a proposed Federal actions'

impact, informs decision-makers and the public of reasonable alternatives capable of avoiding or minimizing adverse impacts, and serves as a decision-aiding mechanism to ensure that the policies and goals of NEPA are infused into Federal agency actions. This EA was prepared by integrating as many of the natural and social sciences as warranted based on the potential effects of the proposed action. The direct, indirect, and cumulative impacts of the proposed action are analyzed.

Endangered Species Act: Under the ESA, all Federal agencies are charged with a responsibility to conserve endangered and threatened species and to utilize their authorities in furtherance of the purposes of the ESA (Sec.2(c)). WS conducts Section 7 consultations with the USFWS to utilize the expertise of the USFWS to ensure that, "*Any action authorized, funded or carried out by such an agency . . . is not likely to jeopardize the continued existence of any endangered or threatened species* . . ." (Sec.7 (a) (2)). WS conducts formal Section 7 Consultations with the USFWS at the national level (USFWS 1992) and consultations with the USFWS at the local level as appropriate.

Migratory Bird Treaty Act of 1918 (16 U.S.C. 703-711; 40 Stat. 755), as amended: The MBTA provides the USFWS regulatory authority to protect species of birds that migrate outside the United States. The law prohibits any "*take*" of these species by private entities, except as permitted by the USFWS; therefore the USFWS issues permits to private entities for reducing bird damage (50 CFR 21.41). WS provides on-site assessments for persons experiencing migratory bird damage to obtain information on which to base damage management recommendations. Damage management recommendations could be in the form of technical assistance or operational assistance. In severe cases of bird damage, WS provides recommendations to the USFWS for the issuance of DPs to private entities. Starlings, Pigeons, House Sparrows and domestic waterfowl are not classified as protected migratory birds and therefore have no protection under the MBTA. USFWS DPs are also not required for "Yellow-headed, Red-winged, Rusty, and Brewer's Blackbirds, Cowbirds, all Grackles, Crows, and Magpies found committing or about to commit depredation upon ornamental or shade trees, agricultural crops, livestock, or wildlife, or when concentrated in such numbers and manner as to constitute a health hazard or other nuisance" (50 CFR 21.43).

The Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d, 54 Stat. 250), as amended: The BGEPA enacted in 1940, prohibits anyone, without a permit issued by the Secretary of the Interior, from "taking" bald eagles, including their parts, nests, or eggs. The Act provides criminal penalties for persons who "take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle ... [or any golden eagle], alive or dead, or any part, nest, or egg thereof." The Act defines "take" as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb[35]." In addition to immediate impacts, this definition also covers impacts that result from human-induced alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagle's return, such alterations agitate or bother an eagle to a degree that interferes with or interrupts normal breeding, feeding, or sheltering habits, and causes injury, death or nest abandonment. A violation of the Act can result in a fine of $100,000 ($200,000 for organizations), imprisonment for one year, or both, for a first offense. Penalties increase substantially for additional offenses, and a second violation of this Act is a felony.

Federal Insecticide, Fungicide, and Rodenticide Act: FIFRA requires the registration, classification and regulation of all pesticides used in the United States. The EPA is responsible for implementing and enforcing FIFRA. All pesticides used or recommended by the WS program in Nebraska are registered

[35] For purposes of these guidelines, "disturb" means: "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available: 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior."

with, and regulated by, the EPA and the NDA. Nebraska WS uses all chemicals according to label directions as required by the EPA and NDA.

National Historical Preservation Act (NHPA) of 1966 as amended: requires: 1) Federal agencies to evaluate the effects of any Federal undertaking on cultural resources, 2) consult with the SHPO regarding the value and management of specific cultural, archaeological and historic resources, and 3) consult with appropriate American Indian tribes to determine whether they have concerns for traditional cultural resources in areas of these Federal undertakings.

Each of the bird damage management methods described in the EA and in Appendix C that might be used operationally by WS do not cause major ground disturbance, do not cause any physical destruction or damage to property, do not cause any alterations of property, wildlife habitat, or landscapes, and do not involve the sale, lease, or transfer of ownership of any property. In general, such methods also do not have the potential to introduce visual, atmospheric, or audible elements to areas in which they are used that could result in effects on the character or use of historic properties. Therefore, the methods that would be used by WS under the proposed action are not generally the types of activities that would have the potential to affect historic properties. If an individual activity with the potential to affect historic resources is planned under an alternative selected as a result of a decision on this EA, then site-specific consultation as required by Section 106 of the NHPA would be conducted as necessary.

There is potential for audible effects on the use and enjoyment of a historic property when methods such as propane exploders, pyrotechnics, firearms, or other noise-making methods are used at or in close proximity to such sites for purposes of hazing or removing nuisance birds or other wildlife. However, such methods would only be used at a historic site at the request of the owner or manager of the site to resolve a damage or nuisance problem, which means such use would be to benefit the historic property. A built-in mitigating factor for this issue is that virtually all of the methods involved would only have temporary effects on the audible nature of a site and can be ended at any time to restore the audible qualities of such sites to their original condition with no further adverse effects. Site-specific consultation as required by Section 106 of the NHPA would be conducted as necessary in those types of situations.

Depredation, Control and Conservation Orders

The regulations contained in 50 CFR part 21 supplement the general permit regulations with respect to permits for the taking, possession, transportation, sale, purchase, barter, importation, exportation, and banding or marking of migratory birds. This regulation also provides certain exceptions to permit requirements for public, scientific, or educational institutions, and establishes depredation orders which provide limited exceptions to the MBTA (see 50 CFR part 21 for the complete regulation). Upon the receipt of evidence clearly showing that migratory birds have accumulated in such numbers in a particular area as to cause or about to cause serious damage to agricultural, horticultural, and fish cultural interests, the USFWS Director is authorized to issue by publication in the Federal Register with respect to a DO to permit the killing of such birds under certain conditions. The following DOs are mentioned or pertinent to this EA.

§21.47 Depredation order for Double-crested Cormorants at aquaculture facilities. This DO is to help reduce depredation of aquacultural stock by Double-crested Cormorants at private fish farms and State and Federal fish hatcheries. However this DO only applies to commercial freshwater aquaculture facilities and to State and Federal fish hatcheries in the States of Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Minnesota, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, and Texas.

§21.48 Depredation order for Double-crested Cormorants to protect public resources. This DO is to reduce the occurrence and/or minimize the risk of adverse impacts to public resources (fish, wildlife, plants, and their habitats) caused by Double-crested Cormorants. However, DO only applies to in the States of Alabama, Arkansas, Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Michigan, Minnesota, Mississippi, Missouri, New York, North Carolina, Ohio, Oklahoma, South Carolina, Tennessee, Texas, Vermont, West Virginia, and Wisconsin.

§21.49 Control order for resident Canada Geese at airports and military airfields. This DO addresses the control and management of resident Canada geese, as defined in 50 CFR §21.3. The DO authorizes managers at commercial, public, and private airports[36] (airports) (and their employees or their agents) and military air operation facilities (military airfields) (and their employees or their agents) to establish and implement a control and management program when necessary to resolve or prevent threats to public safety from resident Canada geese as per restrictions. Control and management activities include indirect and/or direct control strategies such as trapping and relocation, nest and egg destruction, gosling and adult trapping and culling programs, or other lethal and non-lethal control strategies.

§21.50 Depredation order for resident Canada geese nests and eggs. This DO also addresses the control and management of resident Canada geese, as defined in §21.3. The nest and egg DO for resident Canada geese authorizes private landowners and managers of public lands (landowners); homeowners' associations; and village, town, municipality, and county governments (local governments); and the employees or agents of any of these persons or entities to destroy resident Canada goose nests and eggs on property under their jurisdiction[37] when necessary to resolve or prevent injury to people, property, agricultural crops, or other interests.

§21.51 Depredation order for resident Canada geese at agricultural facilities. This DO addresses the control and management of resident Canada geese, as defined in §21.3. The DO for resident Canada geese at agricultural facilities authorizes States and Tribes, via the State or Tribal wildlife agency[38], to implement a program to allow landowners, operators, and tenants actively engaged in commercial agriculture (agricultural producers) (or their employees or agents) to conduct direct damage management actions such as nest and egg destruction, gosling and adult trapping and culling programs, or other lethal and non-lethal wildlife-damage management strategies on resident Canada geese when the geese are committing depredations to agricultural crops and when necessary to resolve or prevent injury to agricultural crops or other agricultural interests from resident Canada geese.

§21.52 Public health control order for resident Canada geese. This DO addresses the control and management of resident Canada geese, as defined in §21.3. The public health DO for resident Canada geese authorizes management and control activities and entrusts with the State, County, municipal, or local public health agency if the State decided to implement the Public Health Control Order component. The USFWS removed the public health agency as the primary implementing entity and have identified

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[36] Only airports and military airfields in the lower 48 States and the District of Columbia are eligible to conduct and implement the various resident Canada goose control and management program components.

[37] Only landowners, homeowners' associations, and local governments (and their employees or their agents) in the lower 48 States and the District of Columbia are eligible to implement the resident Canada goose nest and egg depredation order.

[38] State and Tribal wildlife agencies in the following States may authorize agricultural producers (or their employees or agents) to conduct and implement various components of the depredation order at agricultural facilities in the Atlantic, Central, and Mississippi Flyway portions of these States: Alabama, Arkansas, Colorado, Connecticut, Delaware, Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, New Hampshire, New Mexico, New Jersey, New York, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Vermont, Virginia, West Virginia, Wisconsin, and Wyoming.

the State wildlife agency (or their agent) as the implementing entity as long as the State, County, or local health agency recommends management action[39].

§21.60 Conservation order for mid-continent light geese. This conservation order addresses management of lesser snow (*Anser c. caerulescens*) and Ross' (*Anser rossii*) geese that breed, migrate, and winter in the mid-continent portion of North America, primarily in the Central and Mississippi Flyways (mid-continent light geese). The following States, or portions of States, that are contained within the boundaries of the Central and Mississippi Flyways: Alabama, Arkansas, Colorado, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, New Mexico, North Dakota, Ohio, Oklahoma, South Dakota, Tennessee, Texas, Wisconsin, and Wyoming. Within the above areas, any State or Tribal government responsible for the management of wildlife and migratory birds may, without permit, kill or cause to be killed under its general supervision, mid-continent light geese.

§21.61 Population control of resident Canada geese. This regulation addresses the control of resident Canada geese, as defined in §21.3. The resident Canada goose population control program is a managed take program implemented under the authority of the MBTA to reduce and stabilize resident Canada goose populations when traditional and otherwise authorized management measures are unsuccessful, not feasible for dealing with, or applicable, in preventing injury to property, agricultural crops, public health, and other interests from resident Canada geese. The USFWS Director is authorized to allow States, including Nebraska, and Tribes to implement a population control, or managed take, program to remedy these injuries. When authorized by the USFWS Director, managed take allows additional methods of taking resident Canada geese, allows shooting hours for resident Canada geese to extend to one-half hour after sunset, and removes daily bag limits for resident Canada geese inside or outside the migratory bird hunting season frameworks. The intent of the program is to reduce resident Canada goose populations in order to protect personal property and agricultural crops and other interests from injury and to resolve potential concerns about human health. The management and control activities allowed or conducted under the program are intended to relieve or prevent damage and injurious situations. No person should construe this program as opening, reopening, or extending any hunting season contrary to any regulations established under section 3 of the MBTA.

Environmental Justice and EO12898 - *"Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations":* Environmental Justice (EJ) is a movement promoting the fair treatment of people of all races, income and culture with respect to the development, implementation and enforcement of environmental laws, regulations and policies. EJ has been defined as the pursuit of equal justice and equal protection under the law for all environmental statutes and regulations without discrimination based on race, ethnicity, or socioeconomic status (The EJ movement is also known as Environmental Equity -- which is the equal treatment of all individuals, groups or communities regardless of race, ethnicity, or economic status, from environmental hazards).

EJ is a priority both within APHIS and WS. EO 12898 requires Federal agencies to make EJ part of their mission, and to identify and address disproportionately high and adverse human health and environmental effects of Federal programs, policies and activities on minority and low-income persons or populations. To meet this, WS developed a strategy that: 1) identifies major programs and areas of emphasis to meet

[39] A direct threat to human health is one where a Federal, State, Tribal, or local public health agency has determined that resident Canada geese pose a specific, immediate human health threat by creating conditions conducive to the transmission of human or zoonotic pathogens. The State or Tribe may not use this control order for situations in which resident Canada geese are merely causing a nuisance. Resident Canada geese eligible for management actions must pose a direct threat to human health. A direct threat to human health is defined as one where a Federal, State, or local public health agency has determined that resident Canada geese pose a specific, immediate human health threat because of conditions conducive to the transmission of human or zoonotic pathogens. Situations where resident Canada geese are merely causing a nuisance would not be eligible.

the intent of the EO, 2) minimize any adverse effects on the human health and environment of minority and low-income persons or populations, and 3) carries out the APHIS mission. To that end, APHIS operates according to the following principles: 1) promote outreach and partnerships with all stakeholders, 2) identify the impacts of APHIS activities on minority and low-income populations, 3) streamline government, 4) improve the day-to-day operations, and 5) foster non-discrimination in APHIS programs. In addition, APHIS plans to implement EO 12898 principally through its compliance with the provisions of NEPA.

All WS activities are evaluated for their impact on the human environment and compliance with EO 12898 to insure EJ. WS personnel use wildlife damage management methods as selectively and environmentally conscientiously as possible. It is not anticipated that the proposed action would result in any adverse or disproportionate environmental impacts to minority and low-income persons or populations.

Protection of Children from Environmental Health and Safety Risks (EO 13045): Children may suffer disproportionately from environmental health and safety risks for many reasons, including their development physical and mental status. Because WS makes it a high priority to identify and assess environmental health and safety risks that may disproportionably affect children, WS has considered the impacts that this proposal might have on children. The proposed bird damage management would occur by using only legally available and approved damage management methods where it is highly unlikely that children would be adversely affected. For these reasons, WS concludes that it would not create an adverse environmental health or safety risk to children from implementing this proposed action. In contrast, the proposed action may reduce adverse environmental health or safety risks by reducing risks (*i.e.*, disease, bird/aircraft strikes, etc.) to which children may potentially be exposed.

Executive Order 13186 and MOU between USFWS and WS: EO 13186 directs Federal agencies to protect migratory birds and strengthen migratory bird conservation by identifying and implementing strategies that promote conservation and minimize the take of migratory birds through enhanced collaboration between WS and the USFWS, in coordination with state, tribal, and local governments. This EO specifies the need to avoid or minimize adverse impacts on migratory birds when conducting agency actions, as well as the need to restore and enhance the habitat of migratory birds. The proposal, through its standards for incorporation of avoidance and minimization measures, is consistent with the goals of this EO. The local Ecological Services and Regional Offices would review any minimization proposals to ensure they do not adversely affect populations of other migratory bird species. A National-level MOU between the USFWS and WS has been drafted to facilitate the implementation of EO 13186.

Executive Order 13112 - Invasive Species: Authorized by President Clinton, EO 13112 establishes guidance to Federal agencies to prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause. The EO, in part, states that each Federal agency whose actions may affect the status of invasive species shall, to the extent practicable and permitted by law; 1) reduce invasion of exotic species and the associated damages, 2) monitor invasive species populations, provide for restoration of native species and habitats, 3) conduct research on invasive species and develop technologies to prevent introduction, and 4) provide for environmentally sound control, promote public education on invasive species.

The EO also established an Invasive Species Council (Council) whose members include the Secretary of State, the Secretary of the Treasury, the Secretary of Defense, the Secretary of the Interior, the Secretary of Agriculture, the Secretary of Commerce, the Secretary of Transportation, and the Administrator of the EPA. The Council shall be Co-Chaired by the Secretary of the Interior, the Secretary of Agriculture, and the Secretary of Commerce. The Council oversees: 1) the implementation of this order, 2) that Federal agencies activities concerning invasive species are coordinated, complementary, cost-efficient, and

effective, 3) the development of recommendations for international cooperation in addressing invasive species, 4) develop, in consultation with the CEQ, guidance to Federal agencies, 5) facilitate development of a coordinated network among federal agencies to document, evaluate, and monitor impacts from invasive species on the economy, the environment, and human health, 6) facilitate establishment of a coordinated, up-to-date information-sharing system that utilizes, and 7) prepare and issue a national Invasive Species Management Plan.

APPENDIX C

BIRD DAMAGE MANAGEMENT METHODS AVAILABLE FOR USE IN NEBRASKA

The most effective approach to resolving wildlife damage problems is to integrate the use of several methods, either simultaneously or sequentially. IWDM would integrate and apply practical methods of prevention and reduce damage by wildlife while minimizing harmful effects of damage reduction measures on humans, other species, and the environment. IWDM may incorporate resource management, physical exclusion and deterrents, and population management, or any combination of these depending on the characteristics of specific damage problems.

In selecting damage management techniques for specific damage situations and the methods under each alternative, consideration is given to the responsible species and the magnitude, geographic extent, duration and frequency, and likelihood of wildlife damage. Consideration is also given to the status of target and potential non-target species, local environmental conditions and effects, social and legal aspects, and relative costs of damage reduction options. The cost of damage reduction may sometimes be a secondary concern because of the overriding environmental, legal, and animal welfare considerations. These factors are evaluated in formulating damage management strategies that incorporate the application of one or more techniques.

A variety of methods (Table C-1) are potentially available to the WS program in Nebraska relative to the management or reduction of bird damage. WS develops and recommends or implements IWDM strategies based on resource management, physical exclusion and wildlife management approaches. Within each approach there may be a number of specific methods or tactics available.

Table C-1. Bird Damage Management Methods which would be Recommended or Used by WS under each Alternative.

Management Method	Alternative 1 Current Program	Alternative 2 Technical Assistance	Alternative 3 No Program
Habitat Management	Y	Y	No
Lure Crops/Cultural Methods	Y	Y	No
Exclusion	Y	Y	No
Frightening Devices	Y	Y	No
Avitrol[1]	Y	Y	No
Repellents[1]	Y	Y	No
Live Traps	Y	Y	No
Shooting	Y	Y	No
DRC-1339 [2, 3]	Y	No	No
Alpha-chloralose [2, 3]	Y	No	No
Euthanasia	Y	Y	No

1 Mesural is currently not registered in Nebraska.
2 Only certified applicators could use.
3 Only registered for USDA-APHIS-WS use.

Various Federal, State, and local statutes and regulations and WS Directives govern WS use of damage management tools and substances. The following methods and materials are recommended or used in technical assistance and operational damage management efforts of the WS program in Nebraska. The effectiveness of the program can be defined in terms of reduced economic losses, decreased health hazards, minimized property damage and overall improved quality of life.

NON-LETHAL METHODS

On rare occasions, a bird may inadvertently die from the management methods that are implemented. These birds may be killed or injured from capturing/handling procedures, or unknown causes. For example, individual bird weight, stomach contents, or physiology may make it more or less susceptible to

certain non-lethal management methods. Therefore, conditions unknown to WS or beyond WS' control may make some inadvertent mortality occur during some non-lethal damage management implementation.

Resource Management: Resource management includes a variety of practices that may be used by resource owners to reduce the potential for wildlife damage. Implementation of these practices is appropriate when the potential for damage can be reduced without significantly increasing a resource owner's costs or diminishing his/her ability to manage resources pursuant to goals. Resource management recommendations are made through WS technical assistance efforts.

Alter Aircraft Flight Patterns: In cases where the presence of birds at airports results in threats to air traveler safety and when such problems cannot be resolved by other means, the alteration of aircraft flight patterns or schedules may be recommended. However, altering operations at airports to decrease the potential for hazards is not feasible unless an emergency situation exists. Otherwise, the expense of interrupted flights and the limitations of existing facilities make this practice prohibitive.

Relocation of damaging birds to other areas following live capture generally would not be effective or cost-effective. Since Starlings, Blackbirds, Pigeons, and most other damaging species are common and numerous throughout Nebraska, they are rarely if ever relocated because habitats in other areas are generally already occupied. Relocation of wildlife often involves stress to the relocated animal, poor survival rates, and difficulties in adapting to new locations or habitats, or they simply leave the area.

However, there are exceptions to the rule for relocating birds. Relocation of damaging birds might be a viable solution and acceptable to the public when the birds were considered to have high value such as migratory waterfowl, raptors, or T/E species. In these cases, WS would consult with the USFWS and NGPC to coordinate capture, transportation, and selection of suitable relocation sites and generally leg-band the bird(s) prior to release.

Nest destruction is the removal of nesting materials during the construction phase of the nesting cycle. Nest destruction would only be applied when dealing with a single or very few birds. This method is used to discourage birds from constructing nests in areas, which may create nuisances for home and business owners. Heusmann and Bellville (1978) reported that nest removal was an effective but time-consuming method because problem bird species are highly mobile and can easily return to damage sites from long distances, or because of high populations. This method poses no imminent danger to pets or the public.

Cultural Methods. These generally involve modifications to the level of care or attention given to the resource, which may vary depending on the age, size, and location of the resource. Husbandry practices include but are not limited to techniques such as night feeding, indoor feeding, closed barns or corrals, removal of spilled grain or standing water, and use of bird proof feeders (Johnson and Glahn 1994).

Agricultural Producer/Property Owner Practices. These consist primarily of non-lethal preventive methods such as cultural methods and habitat modification. Cultural methods and other management techniques are implemented by the agricultural producer and property owners. Producers and property owners are encouraged to use these methods, based on the level of risk, need, and professional judgment on their effectiveness and practicality. Producer and property owner practices recommended by WS include:

Environmental/Habitat Modification is an integral part of bird damage management. The type, quality,

and quantity of habitat are directly related to the wildlife that are produced. Therefore, habitat can be managed to not produce or attract certain bird species or to repel certain birds. Most habitat management revolves around airports and bird aircraft strike problems in Nebraska. Habitat management around airports is aimed at eliminating bird nesting, roosting, loafing, or feeding sites. Generally, many bird problems on airport properties can be minimized through management of vegetation and water from runway areas. Habitat management is often necessary to minimize damage caused by Blackbirds and Starlings that form large roosts during late autumn and winter. Bird activity can be greatly reduced at roost sites by removing all the trees or selectively thinning the stand. Roosts often will re-form at traditional sites, and substantial habitat alteration is the only way to permanently stop such activity (USDA 1997).

Animal Behavior Modification. This refers to tactics that alter the behavior of wildlife and reduce damages. Animal behavior modification may use scare tactics or exclusion to deter or repel birds that cause loss or damage (Twedt and Glahn 1982). Some but not all devices used to accomplish this are:

- bird proof exclusions
- auditory scaring devices (*e.g*., electronic guards, propane exploders, pyrotechnics, distress calls and sound producing devices
- chemical frightening agents (*e.g*., mesurol, anthraquinone)
- repellents (*i*.e., tactile repellents, surface coverings)
- visual scare devices (*e.g.,* scarecrows, dogs, lasers, spotlights, remote control devices)
- falconry

Bird proof exclusions can be effective but are often cost-prohibitive, particularly because of the aerial mobility of birds which require overhead barriers as well as conventional netting. Exclusion adequate to stop bird movements can also restrict movements of livestock, people and other wildlife (Fuller-Perrine and Tobin 1993). Heavy plastic strips hung vertically in open doorways have been successful in some situations in excluding birds (Johnson and Glahn 1994). Plastic strips, however, can prevent filling of the feed troughs at livestock feeding facilities or can be covered up when the feed is poured into the trough by the feed truck. They are not practical for open-air feedlot operations that are not housed in buildings. Porcupine wire can be placed on ledges to exclude birds from perching or nesting on the ledges. This too can be expensive and debris often collects in the porcupine wire making it ineffective and unsightly.

Auditory scaring devices such as propane exploders, pyrotechnics, electronic guards, scare crows, and audio distress/predator vocalizations, are often not practical in suburban, urban or rural areas if they disturb people or pets. In addition, under large feedlot situations they may not be appropriate because of the disturbance to livestock, although livestock would eventually habituate to the noise. Birds, too, quickly learn to ignore scaring devices if the birds' fear of the methods is not reinforced with shooting or other tactics (Bomford and O'Brien 1990).

Tactile Repellents (*e.g*., sticky or tacky bird repellents such as Tanglefoot®, 4-The-Birds®, and Roost-No-More®) placed in wavy bands will often discourage the birds from specific perches in structures, or on orchard, ornamental, and shade trees. The birds are not entrapped by the sticky substances but rather dislike the tacky footing. A word of caution: some of the sticky bird repellents will discolor painted, stained, or natural wood siding. Others may run in warm weather, leaving unsightly streaks. It is best to try out the material on a small out-of-sight area first before applying it extensively. The tacky repellents can be applied to a thin piece of pressed board, ridged clear plastic sheets, or other suitable material, which is then fastened to the area where damage is occurring.

Surface Coverings: Some birds may be excluded from ponds or other areas using overhead wire grids (Fairaizl 1992, Lowney 1993). These lines should be made visible to the birds by hanging streamers or other objects at intervals along the wires. The objective is to discourage bird feeding activities and not cause bird injury or death. Overhead wire networks generally require little maintenance other than maintaining proper wire tension and replacing broken wires, and the spacing varies with the species being excluded. They have also been demonstrated to be most applicable on areas $\leq$ 2 acres, but may be considered unsightly or aesthetically unappealing to some people. In addition, wire grids can render a pond unusable for boating, swimming, fishing, and other recreational activities. Installation costs are about $1,000 per surface acre for materials. The expense of maintaining wire grids may be burdensome for some people.

Balls approximately five inches in diameter can be used to cover the surface of a pond. A "ball blanket" renders a pond unusable for boating, swimming, fishing, and other recreational activities. This method is very expensive, costing about $131,000 per surface acre of water.

Scarecrows: The use of scarecrows has had mixed results. These techniques are generally only practical for small areas. Scaring devices such as distress calls, helium filled eye spot balloons, raptor effigies and silhouettes, mirrors, and moving disks can be effective but usually for only a short time before birds become accustomed and learn to ignore them (Schmidt and Johnson 1984, Bomford 1990, Rossbach 1975, Mott 1985, Shirota et al. 1983, Conover 1982, Arhart 1972, Bomford and O'Brien 1990). Mylar tape has produced mixed results in its effectiveness to frighten birds (Dolbeer et al. 1986, Tobin et al. 1988). In general, scarecrows are most effective when they are moved frequently, alternated with other methods, and are well maintained.

Dogs: Dogs can be effective at harassing birds and keeping them off turf and beaches (Conover and Chasko 1985, Woodruff and Green 1995). Around water, this technique appears most effective when the body of water to be patrolled is $\leq$ 2 acres in size (Swift 1998). Although dogs can be effective in keeping birds off individual properties, they do not contribute to a solution for the larger problem of overabundant/anthropogenic abundant bird populations (Castelli and Sleggs 1998). Swift (1998) reported that when harassment with dogs ceases, the number of birds usually return to pre-treatment numbers. WS has recommended and encouraged the use of dogs where appropriate.

Lasers are a relative new technique used to frighten and disperse birds from their roosts or loafing areas. Although the use of a laser (the term of "laser" is an acronym for Light Amplification by Simulated Emission of Radiation) to alter bird behavior was first introduced nearly 30 years ago (Lustick 1973), it received very little attention until recently when it was tested by the NWRC. Results have shown that several bird species, such as Double-crested Cormorants, Canada Geese, other waterfowl, Gulls, Vultures (*Cathartes aura* and *Coragyps atratus*), and American Crows have all exhibited avoidance of laser beams during field trails (Glahn et al. 2001, Blackwell et al. 2002). The repellent or dispersal effect of a laser is due to the intense and coherent mono-wavelength light that, when targeted at birds, can have substantial effects on behavior and my illicit changes in physiological processes (APHIS 2001). Best results are achieved under low-light conditions (*i.e.*, sunset through dawn) and targeting structures or tree proximate to roosting birds, thereby reflecting the beam. In field situations, habituation to lasers has not been observed (APHIS 2001).

The avian eye generally filters most damaging radiation (*i.e.*, short-wavelength radiation from the sun). In tests conducted with Double-crested Cormorants exposed to a relatively low-power Class-III B laser at a distance of 1 meter, no ocular damage was noted (APHIS 2001). However, unlike birds, the human eye, with the exception of the blink reflex, is essentially unprotected from thermal damage to retinal tissue associated with concentrated laser radiation. Lasers used by WS include the

Class-III B, 5-mW, He-Ne, 633-nm Desman laser, and the Class II, battery-powered, 68-mW, 650-nm, diode Laser Dissuader. Because of the risk of eye damage, safety guidelines and specifications have been developed and are strictly followed by the user (Occupational Safety and Health Administration 1991, Glahn and Blackwell 2000).

Spotlights. The use of light to disturb or move loafing and or roosting birds can be an effective technique. This method is similar to the laser, but has a much reduced price. The sacrifice in reduced pricing also limits the range and effectiveness of this method when compared to the laser.

Remote Control Devices. The use of remote control devices for the purpose of disturbing the activity or behavior of birds is a relatively new concept. These devices have been in existence for many years, but their durability, range, strength and cost have improved dramatically. Remote control devices are available in numerous forms such as: speed boats, helicopters, airplanes, sail boats, race cars, etc.

Falconry is the practice of using falcons and hawks to chasing/hunt other wildlife species and return to the handler. It is regulated under both Federal and State laws and all raptors in the United States are protected under various statutes; any "take" of a raptor must be done under the appropriate permit to be legal. The care and housing of falcons can be expensive (Chamorro and Clavero 1994) and there are drawbacks to using falcons to disperse birds from damage or potential damage sites (Hahn 1996) (*i.e.,* falcons are generally only flown when weather and lighting condition permit).

Live (cage-type) traps[40] (*e.g.*, decoy, clover, goshawk, hoop net, funnel, common pigeon traps, pole traps, bal-chatri traps, mist nets, rocket nets, etc.) are generally enclosure-type traps made of nylon or fine black silk netting, or hardware cloth and come in many different sizes and designs, depending on the species of birds being captured; pole traps employ the use of No. 1½ or other appropriate size leg-hold traps with rubber padded jaws and a slide wire to the ground. The entrances of enclosure traps vary greatly from swinging-door, one-way door, funnel entrance, coral-type, tip-top sliding doors, fly-into nets. Enclosure traps/nets are sometimes baited with grains or other food material which attract the target birds, or they may capture unwarily birds during travel. WS' standard procedure when conducting trapping operations is to ensure that an adequate supply of food and water is in the trap, if appropriate, to sustain captured birds for several days or capture devices are monitored frequently through the day. The traps are checked in accordance with the permits issued by the USFWS.

Chemical Repellents

Methyl anthranilate (MA) (artificial grape flavoring used in foods and soft drinks for human consumption) could be used or recommended by WS as a bird repellent. MA is currently registered as a repellent to protect turf from bird grazing and as a spray for airport runways to reduce bird activity/risk on or near airports. It is also being investigated as a livestock feed additive to reduce or prevent feed consumption by birds. Such chemicals undergo rigorous testing and research to prove safety, effectiveness, and low environmental risks before they would be registered by EPA or the FDA.

[40] Pole traps are generally set for raptors which perch on poles and are used to capture raptors to protect human health and safety, T&E species, and propagated game animals that are penned or enclosed in a manner that allows close control by the owner (*i.e.*, not free-ranging) and only when all other reasonable and appropriate methods of deterrence and management prove ineffective. Pole traps used between sunrise and sunset must be checked at least every 2 hours and if used between sunset and sunrise must be checked at least once during the night, and must be closed during inclement weather unless they are monitored continuously. Birds captured using pole traps must be relocated a distance sufficient to minimize potential for return to the capture site, except as otherwise authorized by the permit issuing office. Birds caught live using methods other than pole traps may be transported and relocated to another site approved by the NGPC, if required, or may be euthanized.

Mesurol is a chemical repellent used for non-lethal taste aversion. It is registered by the EPA for aversive conditioning egg treatment to reduce predation from Common Ravens, White-necked Ravens (*Corvus cryptoleucas*), and American Crows on the eggs of protected, T/E species, or eggs of other species designated to be in need of special protection (EPA Reg. No. 56228-33). Mesurol is registered for WS use only. The active ingredient is methiocarb which is a carbamate pesticide which acts as a cholinesterase inhibitor. Species which feed upon treated eggs may show signs of toxicity (*e.g*. regurgitation, lethargy, temporary immobilization). Occasionally, birds may die after feeding upon treated eggs, but most birds exposed to treated eggs survive. Avery et al. (1995) examined the potential of using eggs injected with 30mg of mesurol to condition Ravens from preying on eggs of endangered California Least Terns (*Sterna antillarum*). The result concluded that proper deployment of treated eggs can be a useful, nonlethal method of reducing Raven predation at Least Tern colonies. Avery and Decker (1994) evaluated whether predation might be reduced through food avoidance learning. They used captive Fish crows (*Corvus caurinus*) to examine avoidance response from mesurol (18mg/egg) and MA (100mg/egg). Their conclusion showed that some crows displayed persistence to the 5-day exposure and that successful application may require extended period of training for target predators to acquire an avoidance response. During the spring of 2001, WS conducted a field test on the Sterling Wildlife Management Area in Bingham County, Idaho, where mesurol treated eggs were exposed to Black-billed Magpies (*Pica pica*) to evaluate aversive conditioning to eggs of waterfowl and upland game birds. Magpies feeding on treated eggs decreased after a short period of time, however, their feeding behavior switched to pecking holes in eggs, possibly trying to detect treated eggs before consuming them. This behavior may suggest that at least some birds experienced the ill effects of mesurol, but the *"tasting"* of eggs may result in increased predation (Maycock and Graves 2001).

Anthraquinone (Flight Control™), a non-lethal repellent not currently registered for use on Gulls or Cormorants in some states could be considered for use if it becomes registered in Nebraska in the future. As part of the planning process, analyses of potential effects of this repellant are being addressed in this EA to determine potential effects if and when anthraquinone becomes registered for use in Nebraska on species other than Canada Geese. Similar to MA, this chemical could be used to cause a negative response to feeding in treated areas.

In the United States, the use of anthraquinione as a bird repellent dates at least from the 1940's when the first patent for its use was issued (Avery 2003). Subsequent development and testing of the chemical centered on seed treatments, particularly for pine seeds and rice. It is registered as a treatment to repel birds from turf and grass and as a repellent for roosting birds. Additional bird-repellent applications are being developed for rice and corn seed treatments and aerial application to ripening rice (Avery 2003).

Anthraquinone is a secondary repellent and affects birds by causing post-intestinal distress. Sometimes ingestion of anthraquinone-treated food produces vomiting, but often vomiting does not occur and the bird just sits quietly until the discomfort passes. Anthraquinone is not a taste repellent or contact irritant as the birds do not hesitate to eat treated food, and they exhibit no sign that treated food is unpalatable to them. However, once the birds experience the adverse consequences they learn to avoid the protected food.

Anthraquinone is a stable compound and virtually insoluble in water and there are no known hazards to non-target species from repellent application of anthraquinone It is not phytotoxic and does not inhibit germination of rice seeds or growth of sprouts. It also has a very low toxicity to birds and mammals, and it appears to be innocuous to insects (Avery 2003).

Avitrol is a chemical frightening agent (repellent) that can be effective in a single dose when mixed with untreated baits, normally in a 1:9 ratio. Avitrol, however, is not completely non-lethal in that a small portion of the birds could be killed (Johnson and Glahn 1994). Prebaiting is usually necessary to achieve effective bait acceptance by the target species. Avitrol treated bait is placed in an area where the targeted birds are feeding and a few birds consume treated bait and become affected by the chemical. The affected birds then broadcast distress vocalizations and display abnormal flying behavior, thereby, frightening the remaining flock away. Avitrol is a restricted use pesticide that can only be sold to certified applicators and is available in several bait formulations where only a small portion of the individual grains carry the chemical. It can be used during anytime of the year, but is used most often during winter and spring in Nebraska. Any granivorous bird associated with the target species could be affected by Avitrol. Avitrol is water soluble, but laboratory studies demonstrated that Avitrol is strongly absorbed onto soil colloids and has moderately low mobility. Biodegradation is expected to be slow in soil and water, with a half-life ranging from three to 22 months. However, Avitrol may form covalent bonds with humic materials, which may serve to reduce its bioavailability in aqueous media, is non-accumulative in tissues and rapidly metabolized by many species (Schafer 1991). Laboratory studies with predator and scavenger species have shown minimal potential for secondary poisoning, and during field use only Magpies and Crows appear to have been affected (Schafer 1991). However, a laboratory study by Schafer et al. (1974) showed that Magpies exposed to two to 3.2 times the published Lethal Dose (LD_{50}) in contaminated prey for 20 days were not adversely affected and three American Kestrels were fed contaminated blackbirds for seven to 45 days were not adversely affected. Therefore, no probable risk is expected, based on low concentrations and low hazards quotient value for nontarget indicator species tested on this compound. No probable risk is expected for pets and the public, based on low concentrations and low hazards quotient value for non-target indicator species tested on this compound.

Alpha chloralose (AC) is a chloral derivative of glucose and a central nervous system depressant (*i.e.,* depresses cortical centers in the brain) used as an immobilizing agent to capture and remove nuisance waterfowl and other birds, and for capture of birds for research purposes[41]. It is labor intensive and in some cases, may not be cost effective depending on the application and purpose (Wright 1973, Feare et al. 1981), but is typically used in recreational and residential areas, such as swimming pools, shoreline residential areas, golf courses, or resorts and for the capture of birds for research. AC is typically delivered as well contained bait in small quantities with minimal hazards to pets and humans and the target birds; single bread or corn baits are fed directly to the target birds. WS personnel or other authorized personnel are present at the site of application during baiting to retrieve the immobilized birds. Unconsumed baits are removed from the site following each treatment.

USDA APHIS is currently authorized by FDA to use AC to capture Waterfowl, Coots, Pigeons and Ravens under Investigative New Animal Drug (INAD) 6602 under a category of nuisance animals (Table C-2).

AC was eliminated from more detailed analysis in USDA (1997) based on critical element screening; therefore, environmental fate properties of this compound were not rigorously assessed. However, the solubility and mobility are believed to be moderate and environmental persistence is believed to be low. Bioaccumulation in plants and animal tissue is believed to be low. AC is used in other countries as an avian and mammalian toxicant. The compound is slowly metabolized, with recovery occurring a few hours after administration (Schafer 1991). The dose used for immobilization is designed to be about 2 to 30 times lower than the LD_{50}. Mammalian data indicate higher LD_{50} values than birds. Toxicity to aquatic organisms is unknown (Wornecki et al. 1990) but the

41 With proper use and follow-up, AC reduces the potential for stress, injury and death in many situations over other capture techniques.

compound is not generally soluble in water and therefore should remain unavailable to aquatic organisms. Factors supporting the determination of this low potential included the lack of exposure to pets, nontarget species and the public, and the low toxicity of the active ingredient. Supporting rationale for this determination included relatively low total annual use and a limited number of potential exposure pathways

LETHAL METHODS

Egg addling/destruction is the practice of destroying the embryo prior to hatching. Egg addling is conducted by vigorously shaking an egg numerous times which causes detachment of the embryo from the egg sac. Egg destruction can be accomplished in several different ways, but the most commonly used methods are manually gathering eggs and breaking them, or by oiling or spraying the eggs with a liquid which covers the entire egg and prevents the egg from obtaining oxygen. Although WS does not commonly use egg addling or destruction, it is a valuable damage management tool and has shown to be effective.

Shooting is more effective as a dispersal technique than as a way to reduce bird densities when a large number of birds are present. Normally shooting is conducted with shotguns or air rifles. Shooting is a very individual specific method and is normally used to remove a single offending bird, or group of birds numbering less than 50 at one location. However, at times, a few birds could be shot from a flock to make the remainder of the birds more wary and to help reinforce non-lethal methods. Shooting can be relatively expensive because of the staff hours sometimes required (USDA 1997). It is selective for target species and may be used in conjunction with the use of spotlights, decoys, and calling. Shooting with shotguns, air rifles, or rim and center-fire rifles is sometimes used to manage bird damage problems when lethal methods are determined to be appropriate. The birds are killed as quickly and humanely as possible. All firearm safety precautions are followed by WS when conducting bird damage management activities, and laws and regulations governing the lawful use of firearms are strictly complied with.

Firearm use is very sensitive and a public concern because of safety issues relating to the public and misuse. To ensure safe use and awareness, WS employees who use firearms to conduct official duties are required to attend an approved firearms safety and use training program within 3 months of their appointment and a refresher course every 2 years afterwards (WS Directive 2.615). WS employees, who carry firearms as a condition of employment, are required to sign a form certifying that they meet the criteria as stated in the *Lautenberg Amendment* which prohibits firearm possession by anyone who has been convicted of a misdemeanor crime of domestic violence.

Hunting and DPs. WS sometimes recommends that resource owners consider legal hunting as an option for reducing game bird species damage. Although legal hunting is impractical and/or prohibited in many urban/suburban areas, it can be used to reduce some populations of game birds. Legal hunting also reinforces harassment programs (Kadlec 1968). WS may recommend that resource owners receive DPs from the USFWS to legally take bird species that are protected under the MBTA. In these situations, WS will investigate the complaint and provide this information to the USFWS either recommending or denying the permit application by submitting a Form 37 (Migratory Bird Damage Project Report).

Table C-2. Chemicals Used by Nebraska WS (MIS 2003, 2004, 2005, 2006)**.**

FY	Reg. Number	Species	Quantity Used (Grams)	
			DRC-1339	Alpha-chlorolose
03	56228-10	Starlings	1,676.2	
	56228-28	Pigeons	0	
04	56228-10	Starlings	1,664.5	
	56228-29	Crow	14	
05	56228-10	Starlings	3,149.2	
	56228-30	Starling	226.8	
	56228-28	Pigeon	66	
	56228-29	Crow	2	
	INAD6602	Geese		10.2
06	56228-10	Starlings	9,703.7	
	56228-30	Starling	220.8	
	56228-28	Pigeons	17	
	56228-29	Crow	2	
	INAD6602	Geese		8.650

DRC-1339 is the principal chemical method that would be used for Blackbird, Starling, and Pigeon damage management in the current program and proposed action (Table C-2). For more than 30 years, DRC-1339 has proven to be an effective method of Starling, Blackbird, Gull, and Pigeon damage management at feedlots, dairies, airports, and in urban areas (West et al. 1967, Besser et al. 1967, Decino et al. 1966). Studies continue to document the effectiveness of DRC-1339 in resolving Blackbird and Starling problems at feedlots (West and Besser 1976, Glahn 1982, Glahn et al. 1987); research studies and field observations suggest DRC-1339 treatments kill about 75% of the Starlings at cattle feeding facilities (Besser et al. 1967). Blanton et al. (1992) reports that DRC-1339 appears to be a very effective, selective, and safe means of urban Pigeon population reduction. Glahn and Wilson (1992) noted that baiting with DRC-1339 is a cost-effective method of reducing damage by Blackbirds to sprouting rice.

DRC-1339 is a slow acting avicide that is registered with the EPA for reducing damage from several species of birds, including Blackbirds, Starlings, Pigeons, Crows, Ravens, Magpies, and Gulls. DRC-1339 was developed as an avicide because of its differential toxicity to mammals. DRC-1339 is highly toxic to sensitive species but only slightly toxic to nonsensitive birds, predatory birds, and mammals. For example, Starlings, a highly sensitive species, require a dose of only 0.3 mg/bird to cause death (Royall et al. 1967). Most bird species that are responsible for damage, including Starlings, Blackbirds, Pigeons, Crows, Magpies, and Ravens are highly sensitive to DRC-1339. Many other bird species, such as Raptors, Sparrows, and Eagles, are classified as nonsensitive. Numerous studies show that DRC-1339 poses minimal risk of primary poisoning to nontarget and T/E species (USDA 1997). Secondary poisoning has not been observed with DRC-1339 treated baits. During research studies, carcasses of birds which died from DRC-1339 were fed to Raptors and scavenger mammals for 30 to 200 days with no symptoms of secondary poisoning observed (Cunningham et al. 1981). This can be attributed to relatively low toxicity to species that might scavenge on blackbirds and European Starlings killed by DRC-1339 and its tendency to be almost

completely metabolized in the target birds which leaves little residue to be ingested by scavengers. Secondary hazards of DRC-1339 are almost nonexistent. DRC-1339 acts in a humane manner producing a quiet and apparently painless death. DRC-1339 is unstable in the environment and degrades rapidly when exposed to sunlight, heat, or ultraviolet radiation. DRC-1339 is highly soluble in water but does not hydrolyze and degradation occurs rapidly in water. DRC-1339 tightly binds to soil and has low mobility. The half life is about 25 hours, which means it is nearly 100% broken down within a week, and identified metabolites (*i.e.,* degradation chemicals) have low toxicity. Aquatic and invertebrate toxicity is low (USDA 1997). Appendix P of USDA (1997) contains a thorough risk assessment of DRC-1339 and the reader is referred to that source for a more complete discussion. That assessment concluded that no adverse effects are expected from use of DRC-1339.

DRC 1339 has several EPA Registration Labels (56228-10, 56228-17, 56228-28, 56228-29, and 56228-30) depending on the application or species involved in the damage reduction project.

Snap traps. Wooden based rat snap traps can be effective in killing offending birds, usually Woodpeckers. The trap is nailed to the building with the trigger pointed downward alongside the area of the building sustaining the damage. The trap is baited with nut meats (walnuts, almonds, or pecans) or suet. If multiple areas are being damaged several traps can be used.

Euthanasia. Carbon dioxide (CO_2) gas is a colorless, odorless, noncombustible gas approved by the AVMA as a euthanasia method (Beaver et al. 2001) is sometimes used. CO_2 is a common euthanasia agent apparently because of its ease of use, safety, and ability to euthanize many animals in a short time span. The advantages for using CO_2 are: 1) the rapid depressant, analgesic, and anesthetic effects of CO_2 are well established, 2) CO_2 is readily available and can be purchased in compressed gas cylinders, 3) CO_2 is inexpensive, nonflammable, nonexplosive, and poses minimal hazard to personnel when used with properly designed equipment, and 4) CO_2 does not result in accumulation of tissue residues. CO_2 has been used to euthanatize mice, rats, guinea pigs, chickens, and rabbits, and to render swine unconscious before humane slaughter. Studies of 1-day-old chickens have revealed that CO_2 is an effective euthanatizing agent. Inhalation of CO_2 caused little distress to the birds, suppresses nervous activity, and induced death within 5 minutes. In addition, inhalation of CO_2 at a concentration of 7.5% increases the pain threshold, and higher concentrations of CO_2 have a rapid anesthetic effect. Live birds are placed in a container or chamber and CO_2 gas from a cylinder is released into the chamber. The birds quickly expire after inhaling the gas.

Cervical dislocation, "breaking the neck" or "snapping the spine" is a method intended to cause a quick and painless death, is a technique that has been used for many years and, when performed by well-trained individuals, appears to be humane. This technique can be used to euthanatize poultry, other small birds, mice, and immature rats and rabbits. Manual cervical dislocation is a humane technique for euthanasia of poultry, other small birds, mice, rats weighing < 200 g, and rabbits weighing < 1 kg when performed by individuals with a demonstrated technical proficiency (AVMA 2007).